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SITUS: AN INVESTIGATION INTO THE EFFECTS OF NETWORK CONNECTIONS ON STRATIFICATION USING HISTORICAL MATERIALS (NEW HAMPSHIRE)

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Situs: An Investigation into the Effects of Network Connections on Stratification Using Historical Materials

BY

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DISSERTATION

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This dissertation is dedicated to

Frances and John Sparhawk

My mother and father, without whose love and understanding this book would not have been possible

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SITUS: AN INVESTIGATION INTO THE EFFECTS
OF NETWORK CONNECTIONS ON STRATIFICATION
USING HISTORICAL MATERIALS

by

THOMAS G. SPARHAWK

University of New Hampshire, May, 1983

This dissertation examines the influence of network connections within occupations on intergenerational mobility. Defining situs as the network aspect of an occupation, encompassing both itself and all occupations connected to it through effective networks, the situs of all occupations in late nineteenth-century Portsmouth, New Hampshire, are delineated through a demographic analysis of intragenerational mobility patterns. Once the situs of each occupation was determined, an intergenerational mobility analysis was performed, and it was found that a significant portion of this movement could be attributed to the situs of various occupations.

Major implications of this dissertation included the finding that networks serve to channel intergenerational mobility. Additionally, when utilized, network resources tend to either perpetuate or decrease the son's position in a prestige hierarchy when compared to his father's. Consequently, a resource has been determined, situs, whose net effect is to perpetuate the existing structure of social inequality.

GENERAL INTRODUCTION

Do interactions within social groups contribute to the process of stratification?

To address this question, a data base is needed. The first part of this study shows how such a base was developed. Historical materials were utilized because they are both easily accessible, and cover a period sufficiently long to allow examination of the influence of interaction over time. Once the data base has been established, both its historical context in terms of occupation - the most commonly used measure of placement in a stratification system - and the demographic characteristics of the community must be explored to separate particular changes that were specific to the community in question from more general patterns of movement.

The next task is to determine how group interaction might appear within the data. The second part of this study examines the network approach as applied to employment, and finds that the available materials indicate that networks at the workplace are important sources of information about job vacancies, utilized for initial entry into the labor force, and subsequent career moves.

Having specified this pattern of occupational network connections, this study brings the approach into stratification research by categorizing the situs of any occupation by types of network connections. Situs, referring to a non-vertical differentiator between groups, is a useful concept because it focuses attention on one specified component of occupation - the network component.

The third part of the book proceeds with an analysis of the data. Here an attempt is made to determine which occupations are effectively connected to which other occupations by networks defined by the career mobility of the parental generation. Since available techniques do not produce satisfactory results, an alternate technique was developed. This determination of the situs component of occupations is followed by an examination of the available intergenerational father-son traces that are found in the data set to determine if situs serves to channel intergenerational mobility. Although some aspects of this approach are not supported, in general the operation of situs was supported as one mechanism used in father-son mobility.

The fourth and final part of this book summarizes and discusses the previous chapters. Some implications of situs are discussed, in terms of both stratification theory and the implications that the existence of these patterns have for public policies dealing with employment equality. The study, although not able to offer a definitive conclusion because of its exploratory nature, demonstrates in the end that the interactions within social groups do contribute to the stratification process.

PART ONE

DESCRIPTION OF DATA AND SETTING

INTRODUCTION

To determine the situs component of occupations and the influence of situs on intergenerational mobility a unique data base is required. Most mobility studies select a random sample of workers, then through various methods determine the respondents' occupation and the occupation of their fathers (Rogoff, 1953; Blau and Duncan, 1967). Our concern is with aspects of the labor force that are not approachable using this type of data. We are searching for network contacts in the labor force in order to determine the situs component of occupations and of intergenerational mobility within this pattern of contacts. With this approach, and in view of severe cost limitations, the most useful and readily available data are found in historical material.

Historical records containing occupational information are available for the second half of the nineteenth century from a variety of sources, especially city directories and the manuscript schedules of the United States Census. These sources are prone to a variety of problems (see Thernstrom, 1973; Knights, 1969). Among these are a certain class bias in the directories, some underreporting in the censuses, and the fact that the reported occupational data were not collected for academic purposes or by using a rigid scheme. Problems similar to these are encountered in most contemporary studies, such as imperfect recall, deliberate fabrication, the interviewer effect, and imperfections found in records collected for other purposes. Historical data are useful because they do provide, at relatively little expense, a set of time series data that allow the conventional mobility approach to be greatly expanded.

Within these records, only males are available to be traced over time. This is due to the common cultural tradition of female change of name upon marriage. In addition, women's occupations seem to be inconsistently reported (see Appendix X), their proportion of the total labor force ranging from two percent in 1850 to 25% in 1900. Since the concern here is with occupation, and with both career and intergenerational mobility, only males are available for study: their occupations are consistently reported and, since their names do not change, individual males may be traced by name over time. Consequently, females are not examined in this analysis. This is not a serious problem since most studies of occupational mobility focus exclusively on males.

A further difficulty in using these records is that the focus is on a single community. This leads to biases since only those men who remain in the community are available for tracing. Undoubtably, the mobility experiences and network contacts of men who only "stop over" in the community are different from those of men who remain there most of their lives. This problem would come up in any study of both networks and mobility, and cannot be avoided.

The community selected to serve as the base for our data is Portsmouth, New Hampshire. This small city, located in the southeastern portion of the state, is situated on the banks of the Piscataqua River, with easy water access to the Atlantic Ocean. It became a city in 1849, the year before the first decennial census that we use. This city was chosen for several reasons. First of all, it had a broad industrial base during the time span we examine, a feature allowing for diverse occupational contacts to occur. Secondly, its size and the availability of good occupational records make it an attractive setting. Finally, due to its location near the University of New Hampshire, historical materials are easily accessible, a circumstance allowing us to examine the industrial composition of the community throughout the study period.

Portsmouth, as any small community, is in some ways atypical when compared to the population as a whole. For example, the United States population experienced rapid growth throughout the period examined in this study, but the population of Portsmouth declined until the middle of the period, and only then began to increase. Otherwise, the population of Portsmouth closely reflected that of the United States, with similar age-group composition, life expectancies, and average ages (Chapter Two). However, Portsmouth cannot be considered a representative subset of the nation as a whole.

This chapter and the next look at both the data base and at the city of Portsmouth. In the first chapter we address the collection, manipulation, and correction of our data; and the coding of occupations (our central variable). The final chapter in this part views the city from two perspectives: A brief historical survey of the major industries of the community, and the demographic composition and history of the city. In the latter, rates are developed that will be used later in the study to explain particular findings and patterns.

CHAPTER ONE

THE DATA

This data base was developed to provide "snapshots" of the occupational structure of Portsmouth at five-year intervals between 1850 and 1910. Due to the erratic publication of the Portsmouth city directories this was not always possible. For the entire period, the directories were published only every two, three, or four years. The publication that most closely matched the five year interval was selected in each case. Throughout the project, the interval between data points will be referred to as a five-year interval for ease of presentation. Manuscript United States Census schedules, available at ten-year intervals, caused no problems in this regard.

The most time-consuming task in this project has been the collection and encoding of data. The collection process itself took two years. The end result of this work is a computer file with 47,151 entries from two basic sources; Portsmouth city directories and manuscript schedules of the United States Census. In the following sections both of these sources are discussed, in terms of comparing their strengths, weaknesses, and compatibility.

After examining the raw bases, procedures used for the computerization of the data and the correction of the final data base are examined. Each data source was found to have particular problems in this regard. Finally, we address the coding of occupations, presenting both the rationale for the use of Treiman's (1977a) Standard International Occupational Prestige scale (SIOP), and procedures used to code occupational data using this scale.

Once this work was completed, the result was a clean, useful data base. Since we are focusing on occupation as both dependent and independent variables, only one dimension of the data base is tapped in this project. Age, family composition and size, place of birth, education and, with a little additional work, residence, can all be used as variables for other studies. Our immediate task, however, is to explain the data base as it now exists.

Section I - The Raw Data Bases

Introduction

Data are drawn from two different sources for this project: Manuscript schedules of the United States Census for the city of Portsmouth, New Hampshire, and city directories for the same location. The strengths and weaknesses of each are explored in the appropriate section below. Of the two bases, the census contains by far the most comprehensive information and is discussed first. It is important to note that unless specified otherwise, we are discussing males exclusively.

Manuscript Schedules of the United States Census

(Years 1850, 1860, 1870, 1880, and 1900)

The schedules contain, for every ten years, the following variables;

1) Year of data
2) Household number
3) Respondent's relation to the head of the household
4) Name (first, middle, and last)
5) Age
6) Occupation
7) Place of Birth
8) Schooling
9) Race

Each of these variables is described in detail below, followed by a short discussion of the problems found in each manuscript schedule. All data were copied directly from the microfilm records of the schedules onto data sheets. At a later time, occupations were assigned code numbers (see Section III). All comments in this section pertaining to the collection and encoding of the original census material are from Wright (1900).

Year - Two digit figure indicating year data were collected. Data for 1890, a census year, are not available.

Household Number - A unique number specifying a family unit. Each household was assigned a number in order of visitation in the original census taking. In 1850, these numbers were sequential from 1 to 1844. The later censuses were divided into political wards (three in 1860, 1870, and 1880; five in 1900). Uniqueness was maintained by adding increments of 1000 for each ward (i. e., Ward one, add zero; Ward two, add 1000, and so on). Duplicate numbers were hardled by adding 5000 to the number that would normally have been coded.

Respondent's Relation to Head of Household - Relation to listed household head. In all censuses the enumerators were instructed to list the head of the family first within each unit. In 1880 and 1900, the relationship was indicated on the schedules. In the three other censuses, we used the following procedure to determine relationship: Male "sufficiently" younger than the head, and same last name, code as a son; Males of comparable age with the same last name code as other relative of the head; otherwise code as unrelated. The following is the complete code list and descriptions.

Code	Description
1	Male head of household
2	Son of male head
3	Other relative of male head
4	Son of female head of household
5	Other relative of female head
6	Unrelated to the head
7	Inlaw of the head (1880 and 1900 only)
9	Unknown or Missing

Name - First, last, and middle. These were coded directly as listed. The only modification at this point was that the coders were instructed to add a "jr" to the name of the presumed son when two names appeared in exactly the same form within one family unit. Nicknames (Freddie, Johnny, Tom) were encoded directly as encountered, and not modified until the correction phase of the project.

Age - Full years as of last birthday before census date. In all schedules age was copied directly in two digit form. Those males less than one year old were coded as 00. Those 99 years old or older were coded as age 98, with the 99 being reserved for missing data.

Occupation - As reported. In 1850, enumerators simply listed the occupation as reported by the respondent (who, in all censuses, could be any family member present when the enumerator called). In 1860 and later censuses, the enumerators were required to probe into this variable to determine the occupation from which the majority of income from the previous year was obtained.

Place of Birth - As reported. In the United States, this was either the state itself, or the state abbreviation of the territory if they were born in a U. S. Territory. Outside of the U. S., the country of birth was used. If a state, coders used the ZIP code abbreviation. Missing data were encoded "missing."

Schooling - As reported. The census takers were required to indicate if the person could not read or write, or was attending school. The following codes were used for this variable:

Code	Description
0	Too young for school
1	Attending School
2	Can read and Write
3	Cannot read OR cannot write
4	Cannot read AND cannot write
9	Missing or unknown

Race - As Reported. More than 98% of the population in each schedule was Caucasian. The following scheme was developed for this unvarying variable:

Code	Description
1	Caucasian
2	Black/ mulatto
3	American Indian
4	Other
9	Unknown

Problems

The manuscript schedules were all written in long hand, and, as might be expected, the quality of penmanship left something to be desired. There was only one case of duplication found in the schedules - 1870 - where one family was listed twice (same names, ages, and occupations). This second listing was deleted.

In the 1850 schedule there were two problem areas. The first was easy to overcome - the long "s" that was being phased out during this period. This caused the letter "s" to be encoded as "f" a number of times, but this inconsistency could be found fairly easily. The other problem (which also occurred in 1860) was that capital "L" and capital "S" looked almost exactly alike. This became evident in the tracing when we found that a man's career moved from Lawyer to Sawyer to Lawyer to Sawyer. Either Portsmouth had an odd occupational structure, or this letter confusion was the cause.

Of the next three schedules; 1860, 1870, and 1880, only the last had any extraordinary problems. For all censuses, enumerators were instructed to number families in their order of visitation in each ward. In 1880, however, families in the third ward were numbered for each day's visitation. Consequently, many families in this ward were originally coded with exactly the same number (25 families were numbered one, 24 numbered two, and so on). To maintain a unique numbering system for intergenerational tracing, we added an additional increment of 100 to each day's sequence in this ward (i. e., 2001 to 2009, then 2101 to 2114, and so on).

The most difficult problem occurred in the 1900 schedule (the 1890 census was destroyed and is not available for coding). In this manuscript, computations were written on the schedules themselves on top of the first names. The consequence is that the name reports for the 1900 census are the least reliable of all censuses.

For each schedule a sample of 1000 families were checked from the data sheets to the microfilm. A high error rate of

3.5% was found for the 1850 manuscript, and a low error rate of 2.0% for 1870. The average error rate for the five censuses was 2.6%, comprised mostly of misspellings. Since our coders were unskilled undergraduates, these rates are acceptable. Those errors that were detected seemed to be random, so no bias is suspected. All of these errors were corrected, so we assume that about two percent of our listings are inaccurate because of copying errors.

All things considered, the censuses make an excellent data base. The copying and encoding of data are time-consuming, but the task is relatively uncomplicated. Once encoded, the data base is useful for analytic purposes, and many of the local libraries and historical and genealogical societies find alphabetized copies very useful.

Errors in copying from longhand records to data sheets are prevalent with the manuscript schedules, but not so with the directories. We will discuss directories as data bases below, then examine the integration of the two sets.

<u>Portsmouth City Directories</u>

(Years 1856, 1864, 1875, 1886, 1890, 1895, 1905, and 1910)

Compared to the work that went into producing a useful file from the censuses, that for the directories was relatively easy. City directories were published periodically to serve as a guide to town residents. Since they were for general distribution, they were printed and, consequently, the copying problems found with the censuses do not exist.

The directories list only name, occupation, and residence. Of these, only name and occupation are relevant for this project. Each occupation was assigned a code number before it was entered in the computer (see Section III).

Although these records were easier to process, there are problems with directory listings (which Thernstrom (1975: 180 - 188) examines in depth). Our main concerns are compatibility with the census data, and omissions. The compatibility issue is examined in the next section. Omissions must be addressed, because these may provide a serious bias in tracing.

Thernstrom notes that members of lower prestige groups and new residents in a community are normally underreported in the directories. This would lead to a serious bias if, for example, only a portion of laborers were listed while all the shopkeepers were. Distorted migration and persistence rates, generally biased toward the higher prestige groups, would result from this pattern. Two base years were examined to look at the extent of this problem in our data.

For this checking procedure, every 15th male with an age of 17 or over in the manuscript schedules of 1850 and 1880 was compared to the nearest corresponding directory. In 1850, 61% of these names also appeared in the directory; in 1880, 74%. Based on the number of employed males in the schedules, these figures should have been 69% for 1850 and 88% for 1880 (the proportion males reported in the directories were of the males with occupations reported in the corresponding census). The high discrepency in 1880 (14%, as against 8% in 1850) is accounted for by the fact that the directory used for checking was that of 1881 (the closest available).

Since a small sample was used, the reported occupations were broken into non-manual, manual, and other categories see Section III). In 1850, 66% of the non-manual, 62% of the manual, and 20% of the other group were matched. In 1880, 78% of the non-manual, 77% of the manual, and 33% of the other group were matched. These results show a slight bias against the manual group, but not enough to distort the findings to any great degree. The "other" group is seriously underreported, but since this group includes students, retirees, and missing codes, and involves less than 6% of the attempted matches, this is not considered a significant problem.

The proportion of the entire male population included in the directories improved through time. This increase of coverage serves later as a base for population estimation (see Chapter Two). Table 1.1 shows the progression in coverage in the census years.

In general, the directories serve as an easily accessible data base. When the problems mentioned by Thernstrom are allowed for, and the fact that there are some

Table 1.1
Increase in Directory Coverage
Compared to Census Reports
Males

Year	Census Population	Nearest Directory Population	Proportion Directory of Census
1850	4507	2048 (1850)	.45
1860	4212	1837 (1860)	.44
1870	4198	2555 (1871)	.61
1880	4490	2786 (1881)	.62
1900	4925	3813 (1901)	.77

individuals missed in the directories is taken into account, the directories serve as a useful base from which to calculate mobility.

Their usefulness is improved when the names are matched with the census records. When this is done age, place of birth, education, and race may be added to the barren directory records by a simple tracing procedure. With this expansion, the records become even more useful for examining such relationships as age and ethnicity on occupation.

Once the data have been collected and coded, they must be entered into the computer for manipulation and comparison purposes. In the following section, we discuss some of the problems that were encountered in this process, and some of the solutions that were developed.

Section II - Computer, Corrections, and Compatibility

Introduction

In this section we are concerned with the process of transcribing the collected data into the computer, correcting the data once they had been entered, and examining the compatibility of the two types of data. The latter two operations are somewhat related in that many of the corrections were executed so that the two bases would be the more compatible. The computer system used for this project is the DEC-10, a large time-sharing system. In all instances, undergraduate students did the initial encoding work, and most of the corrections.

Encoding the Data

There are many ways to encode the data, but for manipulation purposes a column format is the easiest to manage. With the variable length of names and birth places in the data, a manual spacing out to a prearranged column length is excessively time-consuming. Therefore, single spaces were left between all variables. In addition, abbreviations for names were used wherever possible. Typing Wm for William, Thos for Thomas, Chas for Charles, and the like saved many keystrokes. Once the file was completed, one command was all that was necessary to change these abbreviations to their full length.

Since the final file would contain all data points, the year is necessary for all records. Each year's data were originally entered onto separate files: one for 1850, one for 1856, and so on. Typing in a single unique character (such as a /) at the beginning of each line allowed one command to change all of these unique characters to the appropriate year.

When originally typed, the data had the general form seen in the following examples.

```
Directory:
/SMITH WM W C99900

Census:
/27 1SMITH WM W 37C99900NH 21
```

After we completed each file, changes were made to expand the listings to their complete form, with all names and years spelled out to their full length. At this point the files were still not columnized. It was a very simple procedure to write a small FORTRAN program to read the data and place appropriate spaces or zeros where necessary to produce a column oriented file. After we changed and columnized the data, they had the following appearance:

```
Directory:
56SMITH          WILLIAM        W           099900

Census:
6000271SMITH          WILLIAM        W          37099900NH        21
```

These are two listings for William W. Smith, one in 1856 (directory), and one in 1860 (census). In 1856, he was reported as a laborer with no industrial affiliation. In 1860, he was reported as being in family number 27, the head of household in that family, 37 years old, a laborer with no industrial affiliation, having New Hampshire as place of birth, literate in reading and writing, and a Caucasian.

Once the data were columnized for each year, a program called SYSTEM 1022 was utilized. This program is designed to handle large masses of alphanumeric data, and has a simple command structure. A program such as this is necessary to manipulate the large number of entries in our computer files.

A file description was created in 1022 defining the variable names, lengths, and character types. For the directory files, this procedure created null (or blank) fields for non-existent variables. Once this was done, the finer, individual corrections could be undertaken.

Corrections

In keypunching, a number of mistakes are unavoidably made - transpositions, missed characters, and misspellings the most common. Once a file was created with all of our cases, a frequency list for each variable could easily be obtained. This procedure greatly enhanced the correction process.

In the initial phase of corrections, frequency lists of first name, last name, and place of birth were obtained for each data year. If a space was left out in the initial punching, a last name might appear "SMITHWILLIAM" with a frequency of one; or a first name of "WILLIAMW", again with one report. These were corrected by a manipulation of the original file. Other errors from these frequency lists include transpositions such as "MSITH" or "WILLAIM" or "HN" for "NH" and so on. In any instance where there was doubt, we referred to the original record.

An occupational frequency list of this type can be examined for illegal codes, and any that are found can be checked against the original record. For example, occupation "0099" does not exist, so a reference to the original record (using last name for directories or family number for censuses) would indicate what the code should be.

These types of errors seemed to vary with the keypuncher. The highest rate was 2.8% for the 1856 directory, and the lowest .9% for the 1880 census. The average error rate for all data points was 1.7%. Typing errors of this kind can seriously distort a data base, so we made every effort to find and correct them.

After each individual year was checked for errors, all thirteen data sets were combined into a single file. When this was done, another correction method became possible, and a serious problem became evident. The problem was that apparently the census enumerators did not ask people how their names were spelled, hence for some of the more unusual names there were five or six different spellings. For example, the Huneyfield family existed in the town for the entire period under study. The name was spelled variously Hunefeld, Huneyfield, Hunnefeld, Hunneffield, Hunnfield, Hunnefield, and Hunnifield.

It was also very common to find "i" substituted for "e" or "y", as in Pryor or Pender (Prior and Pinder), or to find "i" and "e" reversed in a name, such as Pierce and Peirce. The letter "e" was commonly found added onto the end of names for no apparent reason (Greene or Welshe). In itself, these various spellings could be different families within the community. However, when we inspected the data, it was clear that in many cases the last name was the only item that varied. For example, the sequence in Table 1.2 appeared in the data:

Table 1.2
Example of Last Name Variation

Year	Last Name	First Name	Middle Name	Age	Place of Birth
1850	Sanborne	John	H	39	CT
1856	Sanborn	John	H	--	--
1860	Sanborn	John		49	CT
1864	Sanbourn	John	H	--	--
1870	Sarborne	John	H	60	CT

As can be seen, there is every indication that these entries all refer to the same person. Sequences similar to this were found many times in the data, with greater or lesser variation, such as J Henry instead of John H, or age varying as much as 3 or 4 years, or place of birth in a place near the reported state, such as Rhode Island for the example above. In cases such as these, a specific protocol was followed for corrections.

An alphabetic list of all check variables was produced for the entire file (as the list above). We were only concerned with names that appeared in two or more sequential data years. In cases where both first and middle names were exactly the same, and the last name was a simple variant of itself, then all last names for that man were changed to the most frequently occurring last name variant. In cases where at least two census years were part of the sequence, and three or more of the check variables (first name, middle name, age, and place of birth) were found to agree, then the last name of the man and all members of his family were changed to correspond to the most frequently occurring last name variant.

Similar problems were found with first names. There were a number of cases where all other variables except the first name matched, such as Frank in one listing and Franklin in another. In cases of this type, where the same first name might have a variety of spellings, all of one variant were changed to the most common occurrence of the first name variants. For example, all individuals listed as having the first name Franklin had their first name changed to Frank.

Reported middle names had some problems as well, similar to first name. When all other variables matched, the middle name was changed to its initial letter.

In those cases where two individuals had exactly the same name, a JR was added to the younger member if he was obviously a son. In other cases, the names were usually left as they were - a treatment leaving them not traced in our tracing procedure. In doing this we actually decreased the number of cases which could be traced by about 1.5%, but increased the reliability of our results.

We found that printing out the entire file ordered by last name, first name, and middle name was most convenient as a correction base. In this listing occupation was not included because this is used as the dependent variable. If this had been used as a mechanism to aid in tracing, the findings would be biased toward occupational consistency.

Once this listing of the entire file was produced, individual changes could be marked. We found that this procedure saved both computer and real time because having allowed the machine to order our variables, we then visually sorted through the list to spot inconsistencies. The computer is a useful tool for this type of data base. When it is used properly it can create time-saving short cuts that increase the speed of correction by an enormous amount. There is no way to avoid using many hours of computer time, but the results are worthwhile.

Compatibility

With the changes and corrections mentioned above, the two types of data sets became very compatible. Before the corrections were made, a number of name traces were run between pairs of data sets. The same traces were run again after the corrections were completed. In all, there was a ten to twenty percent increase in tracing after correction. Table 1.3 lists the proportions traced both before and after correction.

Table 1.3
Tracing Proportions
Before and After Corrections

Year Pair	Base Size (1)	Proportions Before	Proportions After
1870 - 75	2496	.352	.577
1875 - 80	2496	.408	.631
1886 - 90	2897	.595	.674

(1) Smaller base of pair (e.g., directory).

These figures clearly demonstrate the usefulness of these correction procedures.

Another problem with regard to compatibility was that occupational data were collected for different purposes. In the census they were collected to provide economic information for the census bureau. In the directories they served as a sort of "who's-who" in the community.

Consequently, the directory reports usually produce a higher average prestige score than the census reports. Occasionally, the sequence census - directory - census indicated that an individual had occupations such as "stationary engineer - engineer - stationary engineer". In this example, a prestige shift of 31 units occurred. When it was clear that the same man was being recorded, and the occupational titles were very similar, the directory reports were changed to correspond to the census reports. Changes of this sort were infrequent, totaling perhaps 25 in all.

With these corrections and modifications, it is safe to say that these two bases are both accurate and comparable. The directory base is always smaller than the census, so some traces from source to destination year are lost in the reduction or increase in size. Otherwise, these two sources provide useful information, and function well together.

Section III - The Coding of Occupations

Great care was taken in coding the reported occupations. Since this was the most important variable in this project (and the most problematic - see Udy, 1980), a scheme that could easily encompass the sixty-year period, that was relatively easy to use, and that preserved the greatest information was needed. Such a scale was found in Treiman's (1977a) Standard International Occupational Prestige scale

(SIOP).

As work progressed on this project both advantages and disadvantages in using the SIOP became apparent. A major problem was that there are at least two sources for the occupational variable, the directories and the censuses. Since information was collected for different purposes in each of these (see Section II), the same individual in the same occupation could be assigned two (or more) code numbers, depending on the question being asked by the collectors, and on who was asked (census enumerators usually asked occupational information of whoever was present when they called). A major advantage is that the occupations can be collapsed into larger and larger units of aggregation without the loss of the original specificity or the creation of new variables. These issues are discussed in the following sections.

The SIOP Scale

The occupational composition of a local labor force changes through time due to the introduction of new occupations, the phasing out of older ones, and alterations in the industrial base of the area. When examining the same occupational structure over a long period of time, some scheme is needed that will allow for this change of composition. One strategy, frequently used by historians (see

Katz, 1968; Thernstrom, 1973; Dawley, 1976) is to code all occupations at a high level of aggregation, such as a manual/non-manual split. This is unsatisfactory because of the nature of the project, which is to examine mobility between specific occupations. Another approach is to use a scale that allows for a fine distinction between occupations but is historically unspecific, that is, one that would be equally applicable to a number of different time points. Treiman's (1977a) SIOP scale fits this second approach perfectly (But see Hauser (1982) for a dissenting view.).

The SIOP scale is based on a compilation of a large number of prestige studies carried out since the Second World War. Treiman combined studies from around the world and discovered a astounding similarity in prestige rankings. The average intercorrelation between all of the studies which he examined was a respectable .81 (p. 224). Prestige evaluations in contemporary society are strikingly similar. Indeed, Kraus, Schild, and Hodge (1978: 914) found that even when raters were asked to simply "order" a number of occupations, the results correlated at around .65 with other prestige studies. Finding these similarities, Treiman felt that a general prestige scale could be developed that would be applicable to the occupational structure of any society.

The evaluation of prestige in contemporary societies is highly similar, but what of historical societies? Treiman (1976) addresses this question with his SIOP scale. Using ranking data from a number of historical records (including 14th century Nepal and London in 1890) he found correlations of between .67 and .91 with the SIOP (p. 296). The average correlation for these historical societies with the SIOP was .75; for contemporary societies, it was only .70 (p. 296). This, according to Treiman, is an "indication of great stability over time and place" of prestige rankings (1976: 298).

The theoretical justification for this finding, and for the utility of the SIOP itself, are also presented in Treiman (1977a: Chapter One). Briefly, the justification is as follows:

> a) A similar configuration of occupational roles will develop in all societies beyond the most rudimentary because they face similar "functional imperatives" and are inherently limited in possible organizational forms.
>
> b) Specialization of function implies differences in the control of scarce resources (skill, authority, and prestige), which creates a differential power distribution in all stratified societies.
>
> c) This differential power almost invariably results in the acquisition of special privilege, and the basic similarity in terms of power exercised by various occupations creates a corresponding similarity with respect to occupational differences in privilege.
>
> d) "Power and privilege are everywhere highly valued, and hence powerful and privileged occupations are highly regarded in all societies."

This argument is appealing because it is simple, yet contains all of the elements necessary to justify fully the expectation that prestige will be similarily evaluated in all societies. Using the SIOP allows confidence in knowing that the prestige scores associated with the occupational codes will fairly accurately reflect the actual prestige evaluations that would be present in the population. However, this is only one aspect of the scale's utility.

The second feature of the SIOP useful for this research is the structure of the code itself. Each occupational code number is composed of four digits (in this data from 0011 to 1300). The first two digits (ranging from 00 to 13) are the "major group" classifications and collapse fairly well into the Edwards (1943) census classifications. The first three digits together (ranging from 000 to 130) delineate the "minor groups", and all four digits together comprise the "unit group" code. Each of these codes has an associated prestige score, the more extended codes (unit or minor group) being used by Treiman to arrive at the prestige scores for the groups at higher levels of aggregation.

For example, stock clerks have the unit group code 0391, with a prestige score of 30. Minor group 039, clerical and related workers, contains all unit groups with 039 as the first three digits, and has a prestige score of 38. The major group, clerical and related workers, code 03, contains all minor groups with the first two digits of 03, and has a prestige score of 41. The change in prestige scores is a result of Treiman's use of weighted averages (1977a: 184 - 189) of the prestige scores of the more specific occupations.

This feature of the SIOP is a great advantage for occupational research. Beside allowing great specificity in the coding of occupations, it allows aggregation at three levels, with associated prestige scores, and all without the necessity of recoding the recorded unit group codes.

The SIOP scale itself contains over 500 individual occupations which collapse into 288 unit groups, 86 minor groups, and 14 major groups. In the data base for this project, occupational titles are reported from 185 unit groups, 74 minor groups, and 14 major groups. Due to the nature of the data, three additional SIOP-like code numbers were added to the existing SIOP scale to insure that every reported person had an associated "occupational" code - one for missing data (9999), one for very young children (2222), and one for children in school (3333). These three, since they are not part of the scale, do not have associated prestige scores. With this addition, our data contain 188 unit group codes, 77 minor groups, and 15 major groups.

The Coding of Occupations

In all of our data there were over 1500 specific occupations reported. To assign consistent codes to these throughout our data, a specific procedure was followed. Beginning with the earliest data set (1850), a list of all unique occupational titles was transcribed onto a computer file for storage and sorting purposes. Occupational titles reported in later data sets but not appearing in the first list were added on until a list of all occupational titles was obtained.

After this list was completed, SIOP code numbers were written next to each occupation. The assignment of these codes followed the procedures found in Treiman (1977a: Chapter Nine), and need not be discussed in depth here. In general, when an occupational listing corresponded exactly to an occupation listed in the SIOP, the identical unit group code number was assigned to that occupation. In the large number of cases where there was not exact correspondence, the occupation was assigned either the unit group code that had a very close correspondence (chef as cook, for example), or the International Standard Classification of Occupations was consulted as specified by Treiman. If neither of these gave a satisfactory clue as to what to code the occupation, the residual "unclassifiable" was used (tress tender (sic), supercargo, and laboratory were some occupational titles that could not be classified).

After this list of occupations had been coded, the list and the raw data were given to undergraduate coders with instructions to write the occupational code number next to names the occupations of which exactly matched the occupational titles in the code list. For various reasons, some occupational titles were omitted in the original listing process. Any occupation found by the coders that was not on the original list was to be noted separately and not assigned a code. This produced a list of new occupations, which were then coded and placed into the master list. This process continued throughout the entire occupational coding phase.

Accuracy was good in this phase of the project. Of the 3000 listings checked, there were 32 errors, or 1%. This is indeed phenomenal when the error rate in other sections of the project are considered. Almost all of these errors were transcriptions - only two errors involved the incorrect assignment of a code to an occupation.

Reclassification and Problems

After all occupations had been coded we noted that some occupational titles occurred only once or twice within the entire data set. In these cases the retention of the codes would only serve to confuse what was already forseen as a complex mobility pattern. Hence, these sparsely populated code numbers were either reassigned or placed in the unclassifiable category. When reassigned, the new code was either within the same minor group as the old code (since this is the level we address in our research), or in a minor group that involved a similar task and had a similar prestige score. Table 1.4 presents a sample of these re-coded codes.

Table 1.4
Sampler of Occupational Code Changes

Old SIOP	Old Title	New SIOP	New Title
0011	Chemist Brewery	1200	Unclassifiable
0054	Medical Inspector	0061	Medical Doctor
0129	Juror	0121	Lawyer
0134	University Professor	0132	Teacher
0151	Writer	0159	Journalist
0591	Menagerie	0599	Other Service Worker
0952	Cement Pipe Maker	0959	Construction n.e.c.

In all, eight of these sparsely populated occupations were recoded to unclassifiable, and 27 were merged into other occupational categories.

When all modifications to the data had been completed, a listing of the number of incumbents in each unit group code for each data year was produced. Within this list, there were twelve unit groups whose proportion of the labor force fluctuated drastically in three or more data years, a circumstance illustrating the difficulties that arise when using two different sources to collect information on the same variable. When we further collapsed these into minor group codes (the level used in this research), the majority of the fluctuations disappeared indicating only small differences between the sources. However, four minor group codes still exhibited a great fluctuation.

These four minor groups (039 - clerical and related workers; 045 - salesmen, shop assistants and related; 054 - housekeeping service workers; and 062 - agricultural workers) of necessity were examined more closely. Table 1.5 presents the proportions in the labor force representing these minor groups for each year of the study.

The first thing to note is that each of these four occupations had an average age much lower than that of the total population (see Chapter Two, Table 2.4). This is an indication that these are entry-level positions, or first jobs. Since the directories do contain some bias against reporting younger members of the community, there would be some underreporting for these occupations during the directory years.

Table 1.5
Problem Minor Groups
(Proportions of Male Labor Force)

Year	Minor Group Code Number 039	045	054	062	Base Number
1850	.049	.005	0	0	2959
1856	.024	.012	0	.001	1979
1860	.011	.044	.010	.027	2698
1864	.048	.009	.001	.001	2796
1870	.018	.074	0	.030	2780
1875	.069	.009	0	.003	2496
1880	.023	.060	.009	.040	3156
1886	.083	.015	.001	.013	2897
1890	.065	.017	0	.008	3663
1895	.072	.020	0	.017	3526
1900	.015	.045	.004	.045	3733
1905	.094	.016	.000	.013	3791
1910	.096	.013	0	.009	3617
Average Age	30.9	30.3	25.8	33.1	37.7

Proportions are of base number. Base is actual SICP report of active population, or number in directory

Upon examination of code 039 (clerical) and 045 (shop assistants), it will be noted further that when one is high, the other is low. The proportion of clerical workers is highest during directory years, and shop assistants during the census years (recall that 1890 and 1910 were from directory sources). This seems to indicate that in the directories, individuals who worked in shops were classified as clerks, while in the census, they were reported as shop assistants. In tracing, this will lead to a high level of connection between these two codes, but on general grounds this connection is to be expected.

Code 062 (farm laborers) has its highest proportion in the census years, as would be expected for codes with young incumbents. However, farm laborers are, on average, the oldest of these four problem codes. What seems to be occurring here is that these individuals are reported as farmers (code 061) during the directory years, leading to a high connection between these two occupations in tracing. Again, this connection is to be expected.

The variation in these three codes seem to reflect simply reporting problems between the two bases, and should cause little problem if the traces are viewed with caution. The last code to be examined here, servants, is more problematic.

This group has the lowest average age of the four codes, so on those grounds its numbers can be expected to be low during the directory years. The gaps that appear around 1870 could be the result of a different classification scheme (for instance calling servants laborers), but there is no information to support this. The only conclusion that can be reached here is that this code is problematic.

Treiman's SIOP code provides a useful and detailed classification of occupations. There are some problems with the two sources of occupational data, but in general they mesh together well. The few problems with the code reports should have little impact on the final results.

The collection and coding of data have produced a large file that can be manipulated to address questions about occupational mobility. With this information in hand, an examination of the demographic base and industrial background of Portsmouth - the source of the data - is in order.

CHAPTER TWO

INDUSTRIAL AND DEMOGRAPHIC COMPOSITION OF THE PORTSMOUTH COMMUNITY

Occupational mobility never occurs within a vacuum. In a longitudinal study it is important to establish the background against which occupational mobility occurs. If a new industry is established in a community, new occupations come into being to produce the product, to manage the workers, and to manage the product itself. On the other hand, when an industry closes there are a loss of some specific occupations and a reduction in support services. The variations in the size of specific occupational categories will influence mobility. If the jobs are not there, they cannot be entered; if they do exist, there is some possibility, however slight, that a specific individual will fill one of those positions during his career.

Occupational mobility is also influenced by the demographic characteristics of the labor force. Clearly, some occupations are closed to the very young or the very old. Some occupations require workers older than those required by other occupations. Deaths among employed workers create vacancies that can alter the rate of movement; the more vacancies, the more mobility. Accounting for age and death distributions gives a clearer picture of potential mobility and of the turnover rate of various occupations, and addresses both the stability of the labor market as a whole as well as specific occupations.

Finally, the national and international context have some influence on a local labor force. This is especially true for Portsmouth during the period under study: Between April of 1861 and the end of the Civil War, employment at the Portsmouth Navy Yard increased over 2400%. The innovation and subsequent commercialization of electric power, the telephone and telegraph, and the flexible horse-bit, all created occupations essentially unknown prior to their introduction, much like the computer industry of today.

These three dimensions - the industrial base, the demographic composition of the area, and the "world" context - are the major (but not the only) components of the environment within which a local labor market functions. The following sections briefly delimit the major facets of the environment found in Portsmouth from 1850 to 1910.

Section I - The Industrial Base

Introduction

This section presents a brief summary of the major industrial sectors found in Portsmouth during our study period. The particular industries examined were chosen on the basis of either the size of the labor force affiliated with the sector or, when affiliation is not known, their salience as a basic industry. In all, eight sectors fall into these categories - brewing, shoe manufacturing, machine production and repair, button manufacturing, cotton goods production, private shipyards, the Portsmouth Navy Shipyard, and transportation in general. Secondary industries and support services are not examined because they are either too small to be of general importance (an umbrella company, precision instrument company, cement pipe manufactory, and the like) or are too scattered to be easily summarized (such as hotels and retail trade).

Like any community during a sixty-year period, Portsmouth both lost and gained basic industries, while those that remained for any length of time had periodic fluctuations in the number of employees. Of the eight basic industries, four came into the community after the beginning of our study period. Three of these were somewhat specialized in nature in the sense that they required more than simple, unskilled laborer for their operation. Prior to the introduction of these industries there were small companies or individual shops that provided a cadre of workers for the larger industries that developed. Without this core of workers, it is doubtful that the industries would have settled in the community.

Seven of these eight industries are examined in Table 2.1, comprising between 19% and 40% of the entire labor force for any point in time. The other industry that meets these criteria, the Morley Button Company, employed a significant portion of the labor force in the later years, but particular industrial affiliation was not available in the original records for workers in this area. This table presents the proportions these industries were of the total male labor force during the period examined.

Table 2.1
Industrial Affiliation
(Percentage of active Male population)

Year	Trans- port	Ship- Building	Navy Yard	Cotton Mills	Brew- ing	Shoe Work	Machine Factory	Total
1850	11.2	1.3	.9	3.9	.1	3.2	4.3	24.9
1856	6.6	6.0	.4	2.8	.2	3.8	3.3	23.1
1860	9.8	5.2	.4	4.4	.6	3.6	3.7	27.7
1864	5.5	2.3	18.9	1.8	.8	2.6	3.8	35.7
1870	6.9	4.1	1.7	5.6	1.4	2.9	4.1	26.7
1875	6.0	2.1	2.4	1.5	.5	2.6	4.2	19.3
1880	7.5	1.5	1.2	3.6	2.0	2.8	3.7	22.3
1886	7.2	1.6	2.2	.3	1.4	3.7	3.8	20.2
1890	8.2	1.3	2.3	.2	6.5	17.6	4.8	40.9
1895	6.8	.9	1.2	.1	3.7	11.9	3.3	27.9
1900	8.8	2.3	.7	.1	4.7	9.6	4.4	30.6
1905	7.1	1.5	4.7	0	2.2	3.8	6.5	25.8
1910	6.0	1.0	4.3	0	1.8	3.2	6.6	22.9

(Button company figures are not available)
All figures are underestimates - See Chapter One

All proportions in this table are probably underestimates because industrial affiliation was not included in the data for all occupations. Even with these omissions, each of these basic industries, at some point in time, comprise a significant portion of the Portsmouth labor force. Those workers not affiliated with these industries performed primarily local functions, serving to maintain the community in some fashion (see Appendices II and III). These basic industries, however, serve as the backbone of the community. Each of these are discussed in the following sections.

<u>Transportation</u> - Between 1850 and 1910, a significant portion of the labor force was involved in transportation-related occupations. The style of transport, however, shifted dramatically during this period. In 1850 sea-going transportation occupations (ships' officers and seamen) comprised about 8% of the total labor force. During the decade the major means of transportation was "coasting," or sailing from port to port while hugging the coastline. With the introduction of the railroads this mode of transport rapidly declined.

The railroads arrived in Portsmouth in the late 1840's, while street railways, horse-drawn and electric, were introduced in 1886 and 1898 respectively. The railroads, and later the street railways, assumed a more and more important place in the economy of Portsmouth, both for the transportation of goods and people, and as major employers.

Table 2.2 illustrates the shift of the transportation function from one mode to another. Note that in Table 2.1 the overall proportion stays fairly constant, except for the early period when the two forms were in competition, and employing more workers than necessary.

Table 2.2
Decadal Proportions of Male Labor Force
Shipping and Other Types of Transportation
(Base number is active population)

Year	Sail Percent	Other Percent
1850	8.3	2.9
1860	6.3	3.6
1870	2.4	4.6
1880	2.3	5.2
1890	0.6	6.6
1900	0.4	8.4
1910	0.4	6.0

Sail occupations are codes 0042 and 0981 only. Other occupations are codes 0351, 0360, 0971, 0983, 0984, 0985, and 0989. See Appendix III for code explanation.

Streetcars never employed a large portion of the labor force. Their main effect was to allow a greater dispersal of the population to locations outside of the city proper. This becomes evident when the proportions of males listed in the directories as residing outside of the city limits is examined. In 1850, there were .5 males per 1,000 listed as living outside of the city of Portsmouth. In 1880 this had increased to 2.2 per 1,000. By 1910, twelve years after the introduction of the electric railway, 23.2 males per 1,000 were listed as residing outside the city limits.

Private Shipbuilding - Shipbuilding has been a part of Portsmouth from the seventeenth century to the present and has involved both private construction and, after 1800, public construction at the Portsmouth Navy Yard. In the private sector, shipbuilding declined rapidly at the beginning of our period. There was a boom in ship construction immediately following the discovery of gold in California (1849), but this was essentially the last gasp of private shipbuilding, although there would be another brief boom during the First World War.

The decline of private ship construction is exemplified in Table 2.3. During the decade of the 1850s, the number of major vessels (250 tons or over) built on the Piscataqua River declined steadily. After the Civil War, no major vessels were built in Portsmouth, the industry being confined to the construction of small craft and fishing vessels.

Table 2.3
Major Vessels Built in Portsmouth
1850 To 1859

Interval	Number Built
1851 - 53	17
1854 - 56	21
1857 - 59	9

Data from Pickett (1979)

Portsmouth Navy Shipyard - The shipyard, while located across the river from Portsmouth in Kittery, Maine, has had, and continues to have, a major impact on the economy and labor force of Portsmouth. The yard has had periodic shifts in employment depending on the demands of the federal government. The most dramatic increase in our period was during the Civil War. During the 1850's the yard languished. There were only 84 employees in April of 1861. With the advent of war, shipbuilding and repair work increased rapidly. By April of 1865 there were 2,455 employees at the navy yard.

After the war yard work again declined and there were periodic threats of closing the yard altogether. The war with Spain brought a brief respite, with regular activities increasing and funds being allocated for a dry-dock, prison, foundry, and hospital. But this was the only major change at the yard until the First World War. No major ships were constructed at the yard from 1870 to 1914.

Cotton Mills - Cotton mills in Portsmouth originated as steam-driven factories in the 1840's. The industry began as a part-factory, part-cottage system. In 1850 three mills in the town employed about 275 males and 280 females on site; another 40 male and 200 female seamers worked in their homes. The situation changed rapidly. By 1860 one company had closed, and the other two had combined. All workers were by then employed in the factory itself, and no work was done at home.

In 1863, the Portsmouth Steam Factory ceased production of shirts and hose and went out of business, partly due to the lack of raw cotton from the southern states. Just one year later enough supplies were reaching the area to allow the Kearsarge Mills to open, and this new company took on most of the workers displaced by the closing of its predecessor.

This mill operated successfully after the war, then declined. In 1880 the factory burned and it was never reopened as a cotton mill, being remodled into a machine shop that stood idle until taken over by Portsmouth Forge Company in 1904.

The Kennedy and Miller Hosiery factory opened soon after the Kearsarge burned, but it existed less than ten years. In its last year the Kearsarge had employed 114 men in spinning, weaving, carding and dyeing; six years later Kennedy and Miller employed only twelve men in the same occupations. When this mill closed a few individuals maintained their occupational titles, apparently trying to make a career in independent weaving. By 1900, however, all occupations involving textile manufacture had ceased to exist in the community.

Breweries - Breweries existed on a small scale in Portsmouth from the early eighteen-hundreds. In the middle 1860s three major breweries develcped; they would ultimately go out of business with the advent of Prohibition in 1918. All three thrived until that time. It is difficult to determine how many people were employed by the breweries because only a few relevant occupations were specified in the data sources - brewers, malsters, hops-masters, and so forth. Other employees were simply classed under the general heading of laborer.

The Frank Jones brewery was by far the largest of the three. In 1896 it produced 250,000 barrels of ale, five times more than its nearest competitor, the Eldredge Brewing Company (Brighton, 1974:174). The third, Portsmouth Brewing, produced even less. All of these breweries produced only ale, and for a time the Jones brewery was the largest producer of ale in the world.

The brewery buildings are all still standing. one is a combination restaurant, theater, and motel; another serves as a store for the sale of automobile parts; and the third is a combination of health club, restaurant, office supplies store, and other small businesses. The breweries that once were the economic mainstay of the community now only supply one part of the requirements of a business establishment - an enclosed space.

Shoe Factories - Shoemakers existed in Portsmouth through the period under study. As the period opened, work was performed for the most part by individuals in small shops. This rapidly changed as the factories moved into town.

The introduction of the Rockingham Boot and Shoe cooperative in 1871 had little effect on the number of shoemakers in town. When the Portsmouth Shoe Company opened in 1880, however, the number of shoemakers doubled, rising from 52 to 113 during the first six years of the company's operation. With a large expansion of the plant in 1886 production increased and by 1890 the company employed 527 men, about 16% of the entire male labor force. Competition from other companies throughout the region and changing styles forced the company out of business in 1904. Its facilities were taken over by the Gale Shoe Company, but Gale was always small compared to its mammoth predecessor, maintaining less than half of the workers who had been previously employed.

Machine Shops - There is little information available about the machine shops in Portsmouth. What is known is that blacksmiths and machinist in small shops, much like the shoemakers mentioned above, existed prior to the introduction of the factory system. Blacksmiths, almost always in individual shops, declined steadily, from 82 reported in 1850 to 42 in 1910. Machinists, on the other hand, posted a large increase in numbers in the mid-1880s with the introduction of the factories. Their numbers rose from 42 in 1850 to 197 in 1910.

Morley Button Company - The Morley Button Company was the only large industry entering the town which did not require an existing pool of at least semi-skilled workers to man the plant. The greater part of the actual production work was done by machines, which needed only a few skilled mechanics for their maintainance. For the rest, the majority were unskilled laborers and women who needed little training. For a time the company was the world's largest producer of paper-mache' shoe buttons. With changing styles these buttons were no longer in demand but instead of closing the company adjusted to meet the times. A direct descendant of this firm - the Morley Company - still exists today, manufacturing paper products, office supplies, and computer-related material.

<u>Other Concerns and Summary</u> - Of all the support services in the community, retail sales had by far the largest number of workers. Working proprietors in everything from candy and clothing to coal sales and haulage continually increased in numbers, a change reflecting the growth of the city proper and the increasing importance of Portsmouth as a regional center. From 90 individual shopkeepers in 1850 to 244 in 1910, this growth was relatively steady.

Additional areas of work included bath houses, where patrons could bathe in the cold waters of the Piscataqua River at high tide, and the Portsmouth Aqueduct Company, which provided water (and, according to Brighton (1973), sometimes frogs) through hollow logs for a small charge. The introduction of a telegraph company, a garage for automobile repair, and insurance companies reflected the influence of both technological and economic change on the area.

Portsmouth went through a number of industrial changes in the sixty years examined by this study. These changes had a significant impact on the mobility potential of men in the community. Another aspect which had a major effect was the area's demographic composition.

Section II - The Demographic Base

Occupational mobility within a local area always occurs within a demographic context. The dynamics of this context influence the rate of geographic mobility, career mobility, and the stability of any particular occupation. The size and age composition of a population influence the availability of occupational vacancies, and the relative competition for these. The death rate within any occupation also has an influence on possible mobility.

Four major aspects of demographic composition are explored here. In all instances, only males are being discussed (see Chapter One). The first characteristic examined is total population size. Since only the five censuses are real approximations of actual size and composition, in this section the procedures used to approximate size for non-census years are discussed. The next section develops approximations of age composition, again directly available only during the census years. Once these are determined, estimates of the number of occupationally active males can be determined.

Building on these two, the third section is a discussion of death. Based on available records, both age-specific death rates and a death rate applicable to the entire active population are developed. The age-specific death rates are used in turn to approximate the expected turnover due to death in the active population. The forth and final section deals with population movement, combining estimates of total size, deaths, and persistence rates to examine the fluidity of the population.

Career mobility and demography are closely intertwined. The latter affects the former by influencing the supply of mobility opportunities. Career mobility, for its part, impacts on demography as people "vote with their feet," as is currently seen in the migration to the sun belt. The industrial base and population composition both strongly influence career mobility.

Population Estimates

The data base contains thirteen data points. Of these, five are from census reports and eight are from Portsmouth city directories (see Chapter One). The total size of the male population is available for all census years, and two directory years when censuses were taken but for which raw census data are not available (1890 and 1910). The directories do not list children and seem to underreport the more mobile males in the community (see Thernstrom, 1973). Our first problem, therefore, is to estimate a total population size for the directory years.

There are a number of methods that can be used to achieve this end. The simplest is a simple linear projection, that is, calculating a trend line from the census figures and estimating the population size at the intervening directory years from this line. The major drawback to this method is that it ignores the massive influx of workers during the period of the Civil War.

Another method, subject to the same difficulty, is a "linear pair" method. This takes the two census counts closest to the year to be estimated and draws a line between them. The point on this line where the directory year falls becomes the estimated population. Since this procedure is the most sensitive to decadal shifts, it is the one used in the main for our estimates.

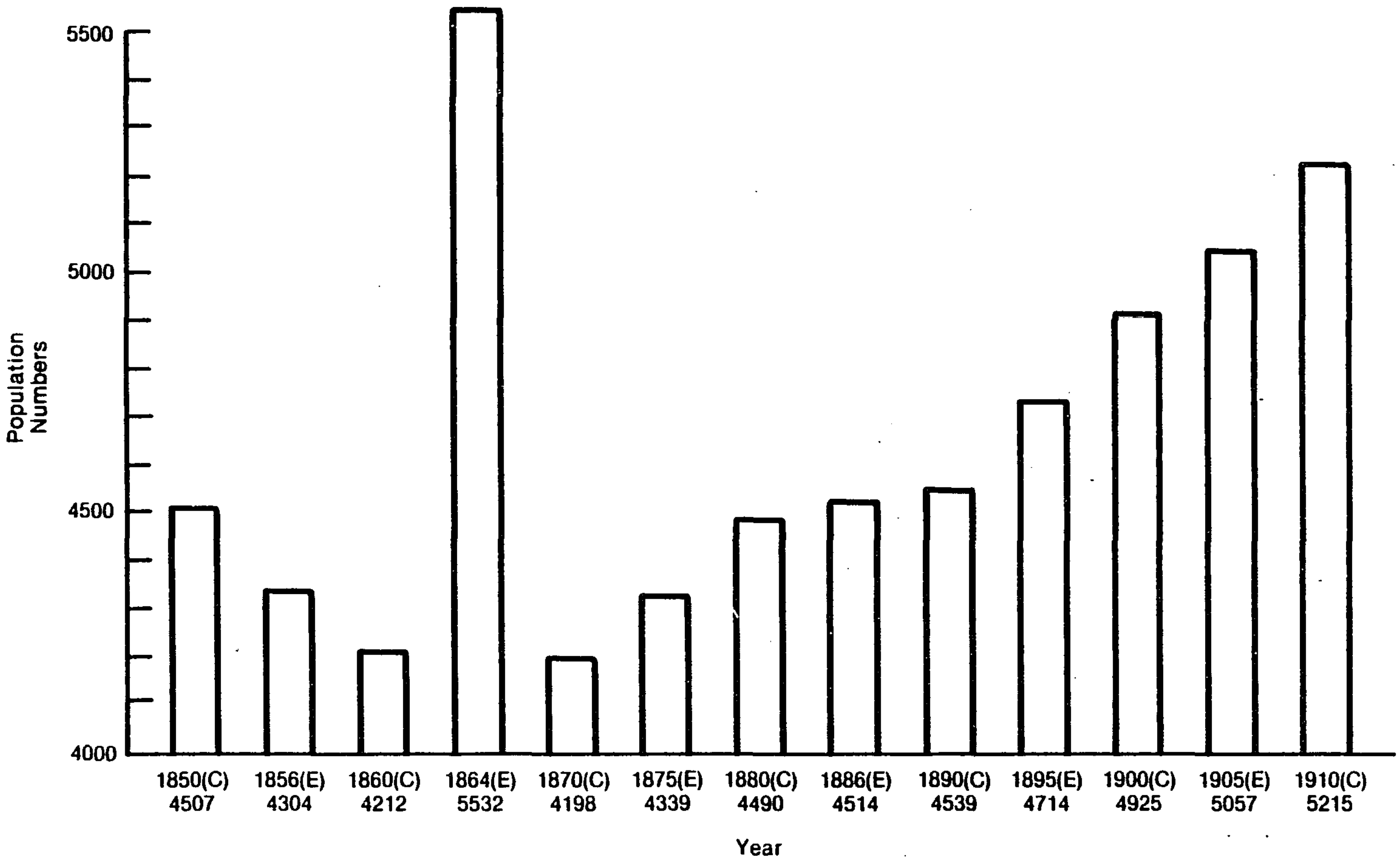
No estimation procedure can be entirely accurate but where there is a lack of secondary information the most parsimonious method should be used. However, when external factors indicate that simple methods give an unrealistic estimate, other procedures must be used to bring the estimation closer to reality. This is the case for the directory year that occurs during the Civil War - 1864 - where a number of sources point to a huge increase in the size of the labor force.

The method chosen to estimate the 1864 population combines both census and directory information. It is assumed that the directory canvassers were fairly consistent in their reporting, and the proportion of the total population reported in the directories does not fluctuate wildly from year to year but remains fairly constant (see table 1.1). This assumption offers the possibility of using the proportion the directory is of the censuses of 1860 and 1870 as a base for estimation. The procedure is used only for 1864 because this is the only point where there is reason to doubt the linear-pair method.

The directory proportion method is straight-forward. The 1860 census population (4,212) is divided into the directory total report (1,837) for that year, yielding the proportion .4361. The same is done for the 1870 census - directory set, respectively 4,198 and 2,555, yielding the proportion .6086. A trend line is drawn between these two years using the proportions. We can then estimate the proportion the directory total is of the total population for 1864 by extrapolation (.5054). This proportion is then divided into the number reported in the 1864 directory (2,796), to give an estimated total population size for that year of 5,532. This is a much more realistic figure than one based on the linear-pair method for this year.

Figure 2.1 charts the estimated and census population totals for Portsmouth for all data years (see Appendix IV).

Figure 2.1
Total Population Size - Males
Census and Estimated Figures



C = Census Report
E = Estimated Figure
Number Below Date Indicates Population Size
(See Appendix IV)

The decrease in the 1850's is a result of the decline in shipping and shipbuilding. The increase in 1864 has been discussed above. The population rise after 1890 is due to the increasing number of positions brought about by the expansion of the industrial base during the period.

Age

Age is an important variable for the computation of a variety of measures in mobility studies. Two of the most salient of these are the average age of the population and death rates. To determine these two items, estimates of age composition are needed. Actual ages are available in only the five years when census data are available so estimates must be obtained for the other eight.

Since total population has been established, the most straightforward method of estimating age group can be followed. We need only assume that each age group increases or decreases in a linear fashion between any two known points, modified by the size of the population at the data point. The following formula is used for this estimation;

$$AGe = (((AG1/TP1)*w1) + ((AG2/TP2)*w2) / 10) * TPe$$

Where

AG = Age Group
TP = Total male population
w = Weight (years between estimated and actual year)
e = Estimated population size
1 = Prior actual count
2 = Post actual count

The following illustrates this formula by estimating the 00 - 04 age group in 1875 from 1870 and 1880 census data.

AGe = (((445/4198)*5) + ((418/4490)*5)) /10) * 4339 = 432

Figures for the census and estimated age groups resulting from these calculations may be found in Appendix IV.

This procedure is followed in estimating all points with the following exceptions; 1) 1905 and 1910 are not bracketed by census counts, so their age composition is based on a linear projection of the 1900 figures. 2) No age figures are available for 1886, 1890 and 1895. The 1890 figures are estimated from 1880 and 1900 census data with the above procedure, and then 1890 is treated as a census report for the estimates of 1886 and 1895.

A problem with this method is that if some change occurs such as heavy migration, the compositional aberration will hold at the same age category rather than "aging" as the population does. Such a problem does occur in this data. In the census counts of 1870, the population pyramid (see Appendix V) shows an indentation in the 5-to-9 and 20-to-24 age groups resulting from, respectively, a lower birth rate during the Civil War, and an increase in the out-migration of young residents after the war reflecting a general westward movement of the United States population to take advantage of the availability of land in the west (Holbrook, 1950). These are again reflected ten years later, with indentations in the 15-to-19 and 30-to-34 age categories in 1880. Again in 1900, the next year a census count becomes available, there is an identifiable indentation in the 50-to-54 age category, but none in the 35-to-39 group, which has probably been overwhelmed by the influx of new workers for the expanding industrial base. Examination of the directory estimates reveals an indentation in the 15-to-19 age category throughout the 1880s and 1890s, and even into the new century. As far as can be determined, this is simply a methodological artifact and not a reflection of the loss of teenagers from the community.

Another problem is that this method assumes complete families make up the entire increase or decline in population size. This is not likely to be the case, particularly in 1864 when workers without families conceivably formed a significant portion of the labor force at the Portsmouth Navy Yard. There is, consequently, some underestimation of the older age groups, and some overestimation of the younger, especially for 1864.

Even with these problems, the estimates are accurate enough to serve our purposes. They can be used to establish estimated death rates in the various age categories and changes in the composition of the population. In addition, average ages can be estimated for all data points. In the censuses, the average age of the entire male population increased from 25.2 in 1850 to 31.7 in 1900. The age of the active population (as defined below) increased from 34.9 in 1850 to 39.6 in 1900. In all cases in Table 2.4, the estimated ages are higher than the census ages because they are based on categories rather than individual reports. They do, however, reflect a similar trend.

Table 2.4
Average Ages
Total and Active Male Population

	Census		Estimated	
Year	Total	Active	Total	Active
1850	25.2	34.9	--	--
1856	--	--	26.2	39.9
1860	25.9	36.6	--	--
1864	--	--	27.4	41.0
1870	28.2	38.5	--	--
1875	--	--	29.5	41.8
1880	29.7	39.0	--	--
1886	--	--	30.9	42.1
1890	--	--	31.3	42.0
1895	--	--	31.7	41.8
1900	31.7	39.6	--	--
1905	--	--	32.3	41.7
1910	--	--	32.3	41.7

Breaking down the population by age category also allows an estimation of the real size of the male working population at any point in time. While data are based on both directories and censuses, only census reports directly approximate the size of the working population. However, with estimates of total population and age categories in hand, the size of the working population during the directory years can be estimated.

Males too young to be employed and/or were attending school were given artificial SIOP code numbers in the census years to distinguish them from the working male population (see Chapter One). If these are subtracted from the total male population figures, the actual number of males assigned a SIOP or missing code is available. This number can be defined as the size of the active population, the total number of males either working or at risk of working (only .01% of all cases were reported as retired). When the number of active males was compared to the age categories in the census years, the active population size was found to be very close to the size of the population aged 15 years or older. Table 2.5 illustrates this point.

Table 2.5
Active Male Population Versus
Population Aged 15 or Over

Census Year	(A) Total Population	(B) Population Aged 15 +	(C) SIOP Assigned	(B - C) Difference
1850	4507	2971	2959	12
1860	4212	2726	2698	28
1870	4198	2899	2780	119
1880	4490	3197	3156	41
1900	4925	3808	3733	75

In Table 2.5, the numbers reported in the column headed "difference" are smaller than the actual number reported in any one-year interval below age 19 (see Appendix IV). On the basis of this comparison, the active population for any directory year can be assumed to be well reflected in the total estimated population aged 15 or more years. For census years, the active population will be those not assigned a "too young" (2222) or an "in school" (3333) code.

Death

Death must be a concern in any analysis involving a longitudinal study of careers. Figures reveal that in any twenty-year period (our basic time frame) fully 40% of the male residents of Portsmouth could be expected to die. Records available in the Portsmouth City Hall indicate the number of males who died within the city limits from 1850 to 1900. But before 1864, the records are scanty. Only three deaths were listed for 1850, and five in 1856. By 1864, however, the reporting seems to have become more accurate, although there is an apparent underreporting in 1875. Place-specific records of deaths are problematic, ignoring residents who die outside the community, but these data are the best available. Table 2.6 indicates the number of male

Table 2.6
Male Deaths
All Available Data

Year	Reported Deaths	Male Population	Deaths Per 1000
1864	92	5532	16.6
1870	60	4198	14.3
1875	34	4339	7.8
1880	76	4490	16.9
1886	99	4514	21.9
1890	135	4539	29.7
1895	126	4714	26.7
1900	114	4925	23.1
Average	92	4656	19.8

residents whose deaths were reported in each data year after 1864.

It will be noted that the death rate seems to increase over time rather than decrease, as would be expected with improved medical care and sanitation. A search of the records indicated nothing that would account for this pattern, so we will assume that it is a result of improved record keeping. The average figure for the entire United States during this period is slightly higher than these data indicate, but Florin (1971) notes the extreme variability in death rates during this time frame. Because of this, the figures are simply accepted as being the best available.

The determination of age-specific death rates requires that the population be placed in age categories. The population and reported deaths were grouped into five-year intervals (0-to-4, 5-to-9, and so on), and combined life tables were constructed for each data point (Barclay, 1958: 93 - 123). These yearly life tables were then combined into one total life table that could be applied to the entire period. This procedure was followed because deaths in any one year could be over- or under-reported. When combined into a single table, the average death experience of the population becomes more accurate, the inaccuracies tending to cancel each other out.

Table 2.7 shows those columns of this combined life table that are of interest here. The complete table may be found in Appendix VI. The five year death rate, 5Qx, is computed based on the age group modifier formula found in Barclay (1958:114).

There are two areas of concern within this table. First, the size of the population for men aged 20 to 39 (especially the 25-to-29 age group) probably reflects increases resulting from in-migration (see next section). Second, notice the

Table 2.7
Combined Life Table
Selected Columns
All Available Data
1864 to 1900
Males

Age	Pop	Dea	5Qx	Ex	Adj
00-04	3553	151	0.191	44.1	----
05-09	3403	27	0.039	49.0	.085
10-14	3436	17	0.025	45.9	.033
15-19	2997	22	0.036	42.0	.042
20-24	3152	42	0.064	38.5	.047
25-29	3311	28	0.041	35.9	.053
30-34	3079	33	0.052	32.4	.052
35-39	2936	37	0.061	29.0	.060
40-44	2522	34	0.065	25.7	.064
45-49	2109	29	0.066	22.4	.081
50-54	1713	40	0.110	18.8	.092
55-59	1499	31	0.099	15.8	.127
60-64	1203	45	0.171	12.2	.161
65-69	1005	48	0.214	9.3	.223
70-74	685	45	0.283	6.1	.500
75+	614	107	1.000	2.5	----

Age - Age Interval
Pop - Total (census and estimated) population in that age group from 1864 to 1900
Dea - Total reported deaths in the age interval for the data years
5Qx - Proportion dying during the interval (see Barclay, 1958: 114)
Ex - Mean life expectancy (years) for that interval
Adj - Three point moving average of nQx
(see Barclay (1958: Chapter 4) for complete information on life table construction)

fluctuation of the death rate (5Qx), whereby some older age groups die at a lower rate than some younger groups. This is especially evident in the 55-to-59 age group. This phenomenon required one final smoothing operation. A simple three point moving average procedure was performed across the age groups, the results being included in the "adjusted" column. It should be noted that the moving average inflates both the first and last entry on the table, but internally it smooths the data to reflect a more natural occurrence of death.

Table 2.7 is based on five-year intervals (the average number of years between our data points). Consequently, each death rate must be read as the rate for a five year interval. These rates are used in the next section, and in our methodological analysis of careers and intergenerational mobility.

Geographic Mobility and Demographic Flows

The final demographic area to be explored is that of geographic mobility. In this study, it is defined as movement into and out of the Portsmouth community. If a male is listed at one point and not listed at a subsequent point, he is considered an out-migrant (or deceased) even though there may simply be an error in the data (see Chapter One). Conversely, with the same caution, a male listed at one point and not listed previously is considered an in-migrant (or an internal recruit - see below).

Two factors beside geographic mobility must be considered in this context. These are death and internal recruitment. Death, the first of these, has been examined above. Across all data points, 9.8% of the population is expected to die in the average five year interval to the next point. The total active population is reduced by this percentage to deflate the number of out-migrants. A single estimate is used here because of the assumed variation in reporting accuracy associated with reported deaths. Although this procedure does not allow for changes in the death rate over time, it is probably more accurate than using yearly rates due to the report variations.

The second factor is internal recruitment. All mobility rates calculated are based on the active population, but there is a large pool of children not shown in these numbers. Some of these children, as they age, join the local labor force.

It will be remembered that code 3333 - "in school" - was registered in the census reports, comprehending the entire population, but not in the directories which were restricted to the adult population. To determine the number of internal recruits, then, traces from code 3333 to any occupational code are established for the available census-directory pairs (i.e., 1850-to-1856, 1860-to-1864, and the like). These five available pairs were combined, and there were in all 456 traces from "in school" codes to some SIOP code. The population aged 10-to-14 during these intervals totaled 2181, so an average of 20.9% of this group was reported as contributing to the subsequent point. This rate was applied to all data points by multiplying the 10-to-14 age group at the previous time point by .209. This contribution is reflected in the "internal recruit" column in Table 2.8. The figures obtained are probably underestimates, but are the safest that can be made under the circumstances.

The active adult male source population serves as the base for all migration rates. This base is the estimated size of the active population, and therefore non-census years could tend to be exaggerated. An inspection of the rates indicates that this exaggeration is probably minimal. In other words, high and low migration rates occur where industrial fluctuations lead us to expect them. Table 2.8 gives the population movement figures for each data point.

It should be noted that the rates arrived at are maximums. The actual size of the population "at risk" for non-census years is in fact the reported directory size, a number that is always smaller than the active population. Actual proportions traced of those reported in the data sources are found in Chapter Six (Table 6.1).

Table 2.8 illustrates the influence of the industrial base on geographic mobility. The two lowest turnover rates occur in 1886 and 1890, during the period of heaviest

Table 2.8
Demographic Input and Output
Active Male Population
(Numbers in parentheses indicate percentages)

Year	(A) Active Source	(B) Non-Migrant	(C) Internal Recruit	(D) In-Migrants	(E) Death	(F) Out-Migrants
1850	2959	1148 (39)	N/A	N/A	290	1521 (52)
1856	2806	1215 (43)	103	1555 (55)	275	1316 (47)
1860	2698	1577 (58)	97	1386 (51)	264	857 (32)
1864	3675	1278 (35)	94	2004 (55)	360	2037 (55)
1870	2780	1441 (52)	125	1377 (49)	272	1067 (38)
1875	3043	1574 (53)	97	1505 (49)	298	1171 (38)
1880	3156	1721 (55)	96	1486 (47)	309	1126 (36)
1886	3295	1953 (59)	93	1481 (45)	323	1019 (31)
1890	3370	2152 (64)	85	1332 (40)	330	888 (26)
1895	3572	1818 (51)	79	1341 (38)	350	1404 (39)
1900	3733	1927 (52)	74	1841 (49)	366	1440 (39)
1905	3907	2197 (52)	69	1911 (49)	383	1327 (34)
1910	4030	N/A	71	1762 (44)	N/A	N/A

A - Active population size (see Table 2.5 and associated text).
B - Number of active population (A) traced to next point.
C - 20.9% of population aged 10 - 14 at previous point (see Appendix IV).
D - In-migrants = A-(B from previous point + C).
E - Number of active male labor force expected to die in the five-year interval (9.8% of A).
F - Out-migrants = A-(B+E).

industrial development. The highest turnover rate outside of the Civil War period is in 1850, a reflection of both the poor reporting in the 1856 directory and the decline in shipping and shipbuilding. During the Civil War, where the highest rate occurs, turnover and out-migration are expected to be high. In-migration rates are again highest during the Civil War and the impoverished 1850s. In general, when the industrial base is strong, individuals tend to remain in the community, and when it is weak, there is a tendency for population movement to increase.

These data indicate that during a time of development the labor force, perhaps due to increased opportunity, becomes relatively stable. Conversely, during economic decline, the labor force become more mobile, with large numbers moving both into and out of the community.

All in all, these movement rates indicate a very fluid population, with an average population turnover of around 50% between each pair of data points. While this is a high rate, Thernstrom (1973:17) found rates in Boston of 150% to 200% during some decades. There are two possible explanations for this discrepency. First, perhaps Thernstrom's use of data from the directories biases his results inasmuch as they could be exaggerated due to city boosterism, the inclusion of women, not accounting for deaths, and so forth (see Parkerson, 1982, for a full critique). The second reason may be that Portsmouth was only one twentieth the size of Boston, and perhaps movement in this smaller population is actually less.

In this chapter we have examined the two most important foundations of the labor market in the Portsmouth, or any, community: the industrial composition and the demographic base. Both of these areas have important consequences for career and intergenerational mobility.

The changing composition of the industrial base, as well as certain outside influences, created a context of constant change within the community. Some areas remained stable, but others fluctuated dramatically. Those that did fluctuate created, with each variation, a slightly different environment within which people pursued their careers. If an industry, such as the cotton mills, ceased to exist, much occupational information, many personal contacts, and the understanding of the labor market held by the father would be lost, circumstances resulting in greater difficulties for the son when he tries to enter the labor market.

Demographically, we have again documented a community in flux, with high turnover and death rates. Within the context of this community, many ties that could be utilized to gain entry into positions would be broken, a circumstance again resulting in difficulties for initial entrants.

An examination of the industrial and demographic bases shows that this community was in a constant state of change. Along with this, broader social trends, such as an increasing rigidification of labor market entry requirements (i.e., education) and industrialization, would introduce even more change into the community. In the analysis chapters these forces are examined through a description of changes in the labor force of the Portsmouth community. Prior to this examination, Part II presents an expansion on the conventional view of occupational mobility.

PART TWO

NETWORKS, SITUS, AND MOBILITY

INTRODUCTION

In recent years attention has been called to the fact that most studies in stratification have ignored the textured nature of the occupational structure (Spilerman, 1977) by focusing their examinations on occupational categories, not occupational roles (Udy, 1980). By looking at occupational mobility within an interlocking set of roles, the question of why intergenerational mobility is patterned the way it is may be addressed.

"Ignoring the textured nature of the labor market means it is treated implicitly as an undifferentiated entity" (Spilerman, 1977: 552). Since most stratification studies do not address a differentiated occupational structure, each occupation is seen as an entity in-and-of itself. Thus, a supervisor's position is seen, in the conventional approach, as a position that everyone in the labor market has an equal chance of entering. In reality, workers in the industry where the supervisory position is found are much more likely to obtain that position than is anyone else. Intergenerationally, the son of a man who is occupying the supervisory position is much more likely to enter some position within the industry where his father is located, a point noted by Blau and Duncan (1967). A realization of this patterning is what is indicated by the concern with a textured labor market.

One important basis for the view of the labor market as textured is that occupations must be seen as roles, within which people perform specific activities and interact with others. Udy (1980) points out that when occupations are viewed as categories - the conventional approach - the occupational structure becomes a belief system to which people are oriented. When it is seen as an interlocking set of roles, various regularities and patterns may be discerned that have real consequences for the movement of people within careers, and for intergenerational mobility.

In this study our goal is to explore one aspect of this textured labor market. We show that role interaction through networks forms specific groupings within the labor force during the careers of men in a small nineteenth-century community. These groupings are then used as one aspect of an intergenerational study. We find that when these networks are utilized by sons entering the labor force, the net effect is a perpetuation of the existing inequality structure.

The first chapter in this part develops a specific theoretical approach to the problem of a textured labor market. We examine networks and find that they serve as a useful base for the establishment of occupational connections. This approach is brought into the realm of mobility studies with the use of the situs concept - a non-vertical form of occupational differentiation. This serves as a useful organizing concept.

In all, we are not attempting to predict that this textured labor market conceptualization will greatly assist us in predicting the movement of specific sons, or specific occupational groups. Rather, we demonstrate that by bringing the ideas developed here into the context of the study of mobility, a clearer understanding of how stratification comes about will be obtained.

CHAPTER THREE

THE IMPORTANCE OF NETWORKS IN MOBILITY

"Who gets what and why?" was Lenski's (1966) question about stratification in the United States. Sociologists have spent considerable time investigating the vast inequality in the distribution of valued items in our society and the perpetuation of this inequality between generations. Within the context of the labor market, most research in stratification has basically examined two questions: To what extent are occupational inequalities transmitted between generations? And how do individual attributes contribute to a person's placement in an occupational hierarchy? Both of these questions are currently examined by addressing characteristics of individuals. We will briefly examine these approaches, then discuss how the social situations within which people interact may also influence mobility.

In the context of a labor market, the primary concern of this project, there are two main research traditions in stratification: conventional mobility analysis and the status attainment school. They can be distinguished by their primary units of analysis and their typical methodologies. Other research approaches are being explored, such as a concern with the segmented labor market (Tolbert, Horan and Beck, 1980) and institutional approaches (Baron and Biebly, 1980), but the field is still dominated by, and our basic knowledge about stratification is derived from, the mobility analysis and status attainment traditions.

Conventional mobility analysis is primarily focused on the question of the extent of the transmission of occupational inequality between generations based on a comparison of the occupational ranks of father and son pairs, usually in a comparative perspective. This area of analysis typically employs some form of matrix manipulation to arrive at its conclusions. Some exemplary studies include those of Rogoff (1953), Glass (1954), and Pullum (1975).

Status attainment research, first introduced in its present form by the pioneering work of Blau and Duncan (1967), "has focused mainly on differences in attainment associated with characteristics of individuals." (Sorensen and Tuma, 1979). Multiple regression techniques are utilized to determine what impact a variety of individual attributes, such as fathers' occupational prestige and education, and sons' first job and education, have on sons' final placements in the occupational hierarchy. Some recent work in this area includes Hauser and Featherman (1977), Sewell and Hauser (1975), and Jencks et al. (1972).

These approaches are similar in two basic ways, the first of which is the way the occupational structure is perceived. On the basis of the functionalist arguments of Parsons (1940) and Davis and Moore (1945), the strata within the occupational structure are seen as having no gaps which would be analogous to class boundaries, but rather as overlapping to such an extent that the structure on the whole appears as a continuous gradation from high to low (Horan, 1974: 536). For the status attainment approach, Blau and Duncan (1967: 123) state that "we are assuming, in effect, that the occupational structure is more or less continuously graded in regard to (socioeconomic) status rather than being a set of discrete status classes." This idea is also at least implicitly adhered to in conventional mobility analysis, as is evidenced by their concern for the overlapping that may occur in the various categories examined (see Glass and Hall, 1954). This focus on the occupational hierarchy as a continuous series of gradations serves both as a theoretical base and as a justification for the use of prestige or status rankings as interval level measurements in status attainment.

The second similarity is that the primary variable used for analysis in both approaches is some form of prestige. Although both socioeconomic status (SES) and the socioeconomic index (SEI) are specified as the measure studied, these may be assumed to be forms of prestige measurement because both are constructed and validated on the basis of prestige (Reiss, 1961). Prestige, essentially, is an attribute of social status that implies degrees of respect, admiration, and deference. In these stratification studies, prestige is considered an attribute of the individual, although it is derived from aggregate occupational characteristics.

There is a long tradition associated with the use of prestige, but particular prestige scores for a wide range of specific occupations were not developed for use in empirical research until the work of North and Hatt in the late 1940s (see Reiss, 1961). The 90 occupations given prestige ratings were increased to include all occupations by Duncan (see Reiss, 1961), using regression techniques to predict occupational prestige from average income and education levels. This was updated on the basis of the 1970 census in Hauser and Featherman (1977).

Prestige is a useful concept in sociology, serving as a measure of occupational class in a large number of studies. The problem is that prestige is only one aspect of occupation. Edy (1980) has called attention to the fact that when using prestige as a measure of class the researcher really has no idea of exactly what aspect of occupation is being examined. Can the varying degrees of respect, admiration, and deference associated with incumbents of an occupation by themselves predict party affiliation (Hamilton, 1972), health (Matras, 1975), psychological distress (Dowdall and Meudell, 1982), social participation (Booth, 1972), satisfaction (Quinn, Stains, and McCullough, 1974), self perception (Yancey, Rigsby, and Norton, 1971), and happiness (Andrews and Withey, 1976)? Probably not, yet these have all been found to be significantly related to occupational class.

One reason for the preeminence of prestige is that prestige information is very easy to gather. All a researcher has to do is ask a person's occupation, and, since all occupations now have associated prestige scores, his prestige is immediately identifiable. Prestige is also a very stable measure. A number of studies of occupational prestige have been examined by Treiman (1977a) and others (see Hodge, Siegel, and Rossi, 1964 for example), and the prestige rankings of occupations were found to be remarkably similar. Even from such disparate time periods and places and seventeenth-century England and twentieth-century Russia occupational prestige rankings are highly correlated. Thus, there is strong evidence that prestige scales are reliable.

Both of the two main stratification approaches not only consider prestige an individual attribute, but they utilize it as both independent and dependent variable, and it is used as the total and only measure of occupation. Status attainment does not attempt to predict a person's occupation, but rather that person's occupational prestige. Conventional mobility analysis does not examine the connection between occupations, but between occupational rankings. In these studies prestige is all there is to an occupation - by definition.

Prestige is obviously useful as one aspect of occupation. And, of course, traditional stratification work does look at aspects other than simply prestige and education. Sex, race, ethnicity, and age are also examined, along with other variables, with significant differences found among most of the categories. However, most studies in this area generally present a very individualistic picture of how mobility occurs. A person's individual characteristics - race, sex, education, and the like - serve as one aspect of the person's credentials. To these are added, in conventional mobility studies, the characteristics of that person's father, and in status attainment studies, all of the above plus some of the initial occupational characteristics of the person. The impression is given that these variables serve as credentials which are taken into the labor market and somehow bartered for occupational prestige. Clearly, there are also social aspects that structure the person's opportunities.

No one would deny that some minimal educational level is necessary for the majority of jobs in our society. The particular level is, of course, dependent on the job sought. Also, no one would deny that sex and race play some role in finding positions. But even if we agree that individual characteristics are important in connecting persons with positions, these individuals are imbedded in interacting social groups. Social groups are to a large extent homogeneous in terms of individual characteristics (Simkus, 1978). It is not the groupings themselves that are useful in understanding the process of stratification, but rather the social networks that are based on membership in these groups.

In the remainder of this chapter we argue that a particular structure of the labor market - a "segmented" labor market - forms contexts for interaction. Within these contexts, individuals in occupations interact in such a way as to share restricted information and outlooks - in networks - thereby creating occupational groupings which contribute to the stratification of an occupational structure.

A critical question that has not been addressed in studying occupational stratification is: How do people get jobs (Lin, Vaughn, and Ensel, 1981)? To approach this point we examine how individuals acquire positions during their careers.

In classical economic theory man is viewed as having both perfect information about available positions, and the ability to make rational decisions based on this information. However, as Granovetter (1974:4) notes, "An individual...is likely to uncover only a small proportion of those openings he might plausibly fill at a given time. The use of mass media and employment agencies does not substantially alter this situation." People do not have perfect information; it is severely restricted. The question to ask now is twofold: How is the information that is acted on by any individual structured? And what effect does this structure have?

Every person exists in some social context. A major part of this context is the social network of which an individual is part. Within this network, which commonly includes relatives, friends, and workmates, the vast majority of a person's interactions will occur. Put another way, most people are only able to share information with others who are within their network. What particular network an individual is in is dependent to a large extent on non-random structural features of a society.

Network analysis has delved into the question of how friends are made and has come up with some interesting results. Fischer (1977) has found significant differences in friendship choices in a number of areas, such as occupational status, economic sector, education, and age. He notes that

> men's positions in the economic structure will influence their friendship choices. People in different lines of work are physically segregated on the job: people in different classes are physically segregated by residence and socially segregated in leisure-time activities...Consequently, the more two men's economic positions differ, the less probable it is that they will become 'close friends' (1977:63).

This is a persistent finding in network analysis (Feld, 1982; James, 1952; Domhoff, 1970).

The meaning of "economic position" poses something of a problem in these studies. While there is agreement that "economic sector" or "class" is an important determinant of friendship choices, the definition of these terms is murky. Fischer (1977:64) breaks the economy into four sectors - production, commerce, construction, and state. Others (Cohen, 1979) use the blue collar/white collar dicotomy. Recent work in economics suggests that a more useful perspective may be market segmentation.

Market segmentation, the theoretical approach that sees the labor market as divided into institutionally and technologically disparate segments (Harrison and Sum, 1979), is a useful perspective to bring to bear on this problem. To illustrate why market segment may be an important determinant of friendship ties, it should first be noted that network analysis has specified an additional important element in friendship choice - the spatial factor (see Fischer, 1977; Feld, 1982; Verbrugge, 1977). People who are in close physical contact, as in a neighborhood or an apartment building, tend to develop at least cursory friendship ties. Laumann (1966:72) reports that there is a strong tendency for neighbors to be in similar occupational categories (in prestige terms), and to be within the same economic sector (see also Fischer, 1977; Feld, 1982).

As has been noted previously occupational prestige, the measure most commonly used for class, is only one aspect of an occupation. In terms of housing, more important predictors of where a person will live are income and style of life. A certain income is necessary to live in a particular apartment or to own a house in a particular neighborhood. Income is also necessary for participation in leisure-time activities, which Fischer (1977:63) found to be another area where friendship ties develop. Styles of life are to some extent determined by the conditions of employment and values held by individuals. While these are correlated to some extent with prestige, this measure is not sufficient in itself to determine a person's spatial placement.

A more useful determinant of income and style of life in relation to housing patterns would be market segment. In the literature that has developed dealing with the segmented labor market, Edwards (1977) provides a useful catagorization. He divides the labor market into three essentially equally sized segments: The secondary market, the subordinate primary market, and the independent primary market. We will discuss each of these briefly below, and then continue our discussion of networks.

The secondary market (Edwards, 1977: 167-169) is the preserve of casual labor. No previous training is required beyond basic literacy. There is virtually no job security, and turnover tends to be high. Jobs that would be found in this market typically include service workers (janitors, waiters, delivery men, and personal care workers), lower level retail and wholesale positions (sales and checkout clerks, inventory stockers, and order takers), low-level clerical (typing, filing, and key-punching), and migrant agricultural labor. Within this segment, pay is typically low, and the lifetime wage curve is flat.

The subordinate primary market (Edwards, 1977: 170-173) includes the traditional working class. This market is characterized by offering some job security through unions or the like, relatively stable employment and some training, usually on the job. Turnover here tends to be low, reflecting a linkage of successive jobs that have at least a token pay increase associated with them. Jobs in this segment would typically include production work (auto assembly, steel making, and electrical product construction), unionized sales work (clerical and administrative jobs), and production-type jobs in core firms (transportation, retailing, and utilities). Within this segment, pay is adequate, and the lifetime wage curve generally rises, then falls late in life. Additionally, work here is generally firm-specific, advancement occurring in the context of a single company.

The independent primary market (Edwards, 1977: 174-177) generally includes professional, managerial, and high-level craft positions. Education is an essential element in this market, and the market offers stable employment with considerable job security and established patterns of career progression. Jobs found here typically include craftwork (electricians, plumbers, steam-fitters, and machinists), middle and upper layer management positions (foreman, bookkeeper, and supervisor), and professional positions (accountants, research scientists, lawyers, and doctors). Within this segment, pay is typically high, and, since the jobs are frequently not firm-specific, turnover also tends to be high.

These brief descriptions show that the segments are characterized by different wage levels and different turnover rates, traits that lead to differing styles of life. In terms of spatial connection, people in the secondary market live in less-expensive areas, and are frequently renters due to high turnover and the unavailability of morgages. This contrasts sharply with the subordinate primary market, where people typically live in moderate houses, or more expensive apartments. People in the independent primary market inhabit the wealthier areas, or the most expensive apartments. These are generalizations, but there would be a tendency for this type of differentiation to occur. Additionally, market segment has some effect on social skills, values and the like that dictate participation in particular leisure-time activities.

There is some unavoidable overlapping due to the conceptualization of these segments, but the segmented labor market idea explains residential segregation in terms of types of employment and income levels. Other factors come into play when dealing with race and ethnicity. In any case, the location of an individual in a segmented labor market has consequences for the development and composition of that person's friendship network. Neighborhoods and social clubs, however, do not make up the totality of possible friendship choices.

Another major area where networks are formed is at the workplace. Friends and acquaintances are frequently made on the job. Fischer (1977:76) noted a significant correlation between friends in terms of occupational prestige. Laumann (1966:65) reported similar findings, and noted that Ellis (1954) and Curtin (1963) also had similar results. Along with the development of friendships, the workplace puts a number of people into close contact, with at least the possibility of sharing information. People who work together are likely to share information about their work. Different placements in the work setting yield different amounts and types of information. Members of some occupational groups interact only among themselves because of their working conditions. Other occupational groups are exposed to not only their own situation, but to other occupational groups in the course of their work (see Broom and Smith, 1963).

Educational institutions also serve as a context within which networks may form. Within any educational setting, most people have similar economic backgrounds and are likely to establish ties with others like themselves. Educational networks, however, have a major difference. They are institutionally maintained. Fraternity membership carries through a person's life. Alumni associations function to keep graduates in contact with, or at least aware of, a number of their classmates. With this institutional organization, even ties formed years earlier might serve to provide information about possible jobs. Indeed, networks formed in this context are unique, and could be the topic of extensive discussion.

Another type of network, the final one that we examine, is an ascribed network; kinship. While kin usually make up only a small proportion of a person's friends in current society, (Laumann (1966: 69) reports about 10% of friends are also relatives) even kin who are not friends usually share information with their relatives. This type of network differs from the others in that it is not primarily based on economic ties. In some instances, a wider range of information is available to people with large kin networks than would be available otherwise. Since most members of given families are in similar economic circumstances, these connections will not significantly increase occupational access for most people. It is a very important information source, however, for a person who has not yet entered the labor force.

The majority of networks that a person is in are economically based. The spatial network forms one restricted pool based on income and style of life. The work-related network forms another restricted pool, frequently overlapping with the spatial. The family network overlaps these two to a large extent, but does offer to some people the possibility of access to additional information.

Economic and market circumstances structure the individual's networks. This structuring restricts the sharing of information, especially about the availability of vacant positions. If a person does not know about a job opening, there is no chance that the individual can acquire the position. Granovetter (1974:4) notes this problem;

> The actual transmission of information about job opportunities becomes a more immediate condition of mobility than any characteristic of the jobs themselves. No matter how great the 'net advantage' to an individual in changing from his present position to some particular new one, he cannot move unless he secures the proper information.

By limiting information, the structure of a labor market has a major impact on a person's mobility chances.

How does this structuring of information influence mobility? With the availability of newspapers, government-sponsored employment agencies and private career counsellors, the influence of networks would seem to be minimal. But a number of studies, conducted from the early 1950s to the present time, indicate that exactly the reverse is true: Networks are inevitably more important than any other single source.

Myers and Schultz (1951), examined displaced textile mill workers in Massachusetts. When the workers were asked how they found out about their first job, 62% said they had acquired this information through acquaintances or relatives. Fifty-six percent also had found out about later employment at the mill through the same sources (1951:53). Since Myers and Schultz were examining displaced workers, they also inquired as to how people found out about their present position. Of their sample, 41% had found out about their present job through acquaintances and relatives, even though about another third of the sample said they had been recalled to their mill job (1951:48).

In another study of Massachusetts mill workers, Miernyk (1955) found that 45% of his sample had first heard about their present job through friends or relatives, even though the mills advertised extensively. He also found that few, if any, workers were well informed about labor market conditions.

Sheppard and Belitsky (1966) examined workers in Erie County, Pennsylvania, with similar results. They found that of all blue-collar males, 56% had first heard about their present job from a friend, relative or other worker. They further broke the sample down and found some variation in skill level. Of the skilled workers, 43% had first heard from a friend, relative or fellow worker; of the semi-skilled, 64%; and of the unskilled, 56%. In all instances, this was the single most important source of job information.

Granovetter (1974) looked at professional, technical and managerial employees in Newton, Massachusetts. He too found that 56% of his sample had first heard about their present job through personal contacts. He further broke this down into "type of friend." Sixty-nine percent of all those who found work through an acquaintance found it through someone they knew through work, 31% through family or non-work friends. Granovetter (1974:57) also pointed out that it was not so much immediate friends who directly gave the person the job information (39%). Friends of friends predominated (45%). This latter point requires further discussion.

There are two aspects of this observation that are important when considering information flows. The first of these is how far will information about vacancies travel? In diffusion studies, information chains are typically very long, information being passed between ten or fifteen people in some cases (see, for example, Rogers, 1962). However, job vacancies are usually very temporary, hence for information about them to be useful it must be passed very quickly. The complete breakdown that Granovetter (1974:57) found for information chain length was: 1=39%; 2=45%; 3=13%; 4=3%. Chain length refers to the number of persons through which vacancy information passed until it reached the person who acted on the information. Because his sample was small his results are only suggestive, but it seems that the most effective chain length encompasses two links, extending only to "friends of friends."

The other important question is where does information about vacancies come from? Granovetter's point about the importance of "friend of friends" is well taken. Consider a person with a number of friends who make up his network, which we can call the primary network. Each member of the primary network, except the person we are focusing on, also has a network of friends, a number of whom are not in the primary network. We can call each of these networks a secondary network. Depending on several factors (such as ethnicity, sex, and geographic location), the number of people in the secondary networks will usually be much larger than the number of people in the primary network. If information about position vacancies is distributed randomly, then simply because of the larger number of people in the secondary networks there is a greater chance of the acquisition of this type of information, regardless of whether some members of this secondary network are in the same occupation as the person of concern.

Simply receiving information about a vacant position, of course, is only one step in the process of mobility. The receiving person must also be qualified for the position and consider the position in some way as equally or more desirable than his current position. Both of these conditions are addressed by the network approach.

In terms of qualifications, since those making network contacts are in similar economic circumstances, it is more than likely that the information that becomes available pertains to openings that are not too dissimilar from the positions currently occupied by members of the network. Information about vacancies that members of the network are not qualified for would be superfluous, and probably would not be tranmsmitted in the first place.

As far as desirability is concerned, Granovetter (1974:13) notes that his respondents "believed that information secured through personal contacts is of higher quality than that available by other means; a friend gives more than a simple job description." On the basis of this statement, the person considering the move would have more information when it is given by a network contact, and could make a more rational decision about whether or not to take the position, then when information comes from elsewhere.

When the labor market is conceptualized in this way, networks become extremely important in determining a person's career mobility. Information about vacancies in some occupations will seldom reach incumbents in others. Conversely, almost all information about vacancies in some occupations will be known through network contacts to members of other occupations. In both cases, the structure of the labor market itself has a major influence on this information flow. How can these networks, then, help us understand the stratification process?

CHAPTER FOUR

THE CONCEPT OF SITUS: A PATTERN OF INTRAGENERATIONAL MOBILITY

The preceding chapter has discussed the influence of networks on career mobility. Obviously, determining the interlocking networks in a labor market at the personal level would be an extremely difficult and expensive task. If we change our perspective slightly and shift from individuals to occupations, it becomes possible to utilize the network approach more efficiently.

There are basically two ways in which occupations can be connected by networks. The first is by simple job contact. Within an occupation, vacancy information will be available about positions related to the occupation itself. This information may be about "career" moves within the occupation, from a lower to a higher rank, or simply about moves to a more desirable position within a firm or organization. Outside of particular settings, job contacts can also be established during the course of a person's work. There are a number of occupations (such as sales clerk and truck driver) whose incumbents interact with members of other occupations in the course of their work (Broom and Smith, 1963). Through this contact, information about vacancies could be exchanged in the normal course of interaction.

The other way that occupations can be viewed is closer to the conventional network idea, and is our primary focus here. Almost any occupation can be seen as involving a number of interacting individuals. If one of these people, for whatever reason, changes jobs, he is likely to stay in contact with some members of his original occupation through non-occupational networks. This contact serves as an information link between the two occupations through which vacancy information could flow. Additionally, some members of this new occupation could have come from some third occupation, thereby creating the possibility of an information link between three (or more) occupations.

In both of these specifications, networks serve as the basic connection among the occupational groups. If we focus on occupations linked in this way, we are in effect examining the influence of networks on career mobility. Using this perspective, occupational networks can best be conceived of as situses.

The situs concept has had a varied history in sociology. Basically, situs refers to site, or location within the context of some larger entity, such as the occupational structure. Here we briefly follow this concept through its development, and then give an alternate definition that is more in line with its original formulation.

In an article that examines in theoretical terms the interrelations of three types of social position (status, locus, and situs), Benoit-Smullyan (1944) first introduced the concept of situs. The basic definition proposed was simply "membership in a social group" (p. 152), to which was appended two specifications. The group must in some ways be identifiable to others in the society (p. 153), and the concept of social group must imply social interaction, interstimulation, and response (p. 153). A cautionary note was included: "Situs distinctions exist whenever a socially accepted classification distinguishes between groups, and whenever membership in a group is considered a socially relevant criterion in making distinctions between individuals. To this may or may not be added a distinction of status" (Benoit-Smullyan, 1944: 154).

Paul Hatt (1950) was the first to utilize the situs concept in empirical research. In noting that a number of dissimilar occupations received the same status score, he wondered whether there might be distinct occupational "families," within which there would be a consistent status hierarchy (1950: 538-539). He identified a number of these families based on "similar relations between occupation and the consuming public" (p. 539), and defined these as situses. Hatt did find some support for situses defined in this way, determining the existence of eight groups of occupations (such as agricultural and business) that constituted "parallel status ladders" (p. 541). However, the only other sociologist to utilize this definition was Carlsson (1958), who could only support an enterpreneurial/ nonenterpreneurial distinction.

The next use of the concept is found in an article by Morris and Murphy (1959). Their concern was to introduce a concept that could be considered a horizontal dimension of the occupational structure (p. 231). They defined a situs as "a category of individuals or positions placed on a level with other categories, all of which are given the same evaluation" (p. 233), and based their situs categories "in keeping with the principle of societal functions" (p. 235). Some support was given to this conceptualization by having a number of raters group occupations into the appropriate ten categories, such as legal authority, commerce, and manufacturing.

A number of authors took this definition to task, their reasoning being that the ten situses proposed could and would be consistently evaluated in a hierarchical fashion. The idea of "equal evaluation" simply did not stand up in the studies of McTavish (1963), Pavalko (1971), More and Suchner (1976), and Villemez and Silver (1977).

Horan (1974) took a different approach to the problem. Referring to both Benoit-Smullyan (1944) and Hatt (1950), Horan defined situs as "any set of occupations defined by some nonprestige criterion" (p. 36). Horan defined situs in this study as caste, noting that caste could be considered a nonprestige criterion (sic), and the interactions within the caste would structure motivations and access to positions

(1974: 39-40). With this definition, situs was shown to have a significant influence on prestige mobility.

The only other work that has dealt with this concept is that of Hauser and Featherman (1977) where situs is defined as "a separate dimension of social space having possible, but not necessary, connections with the status dimension (p. 218)." On the basis of Blau and Duncan's (1967:37) observation that industrial lines constitute stronger barriers to mobility than do skill levels within an industry, situs was defined as industry (p. 221). This operational definition was supported through the use of regression techniques.

From this brief survey of the situs concept it can be seen that a consistent definition is lacking. It is evident, however, that all of these authors are seeking some way to conceptualize an occupational structure in a way that is independent of the prestige concept. The idea of network connections fits neatly into this viewpoint.

To reformulate situs in terms of networks some groundwork must first be laid. In the remainder of this chapter we are primarily concerned with occupational categories. For the sake of convenience, each person in an occupational category within a community is assumed to have at least the ability to contact all other members of that occupational category. This assumption, of course, does harm to reality: If there are two separate facilities where a similar product is produced, the occupational categories that would center on that product would be physically segregated. Data that include work location would be ideal but are not presently available. However, when examining a small community with a diversified industrial base, it is reasonable to assume that the majority of occupations will exhibit this characteristic. In any event, each occupational category is conceived of as a group of men focused on a particular economic task who have the potential to interact.

A second assumption involves network size. Any man can effectively interact only with a limited number of men in his occupation even though he may have access to many others. Some occupations do not contain many incumbents at a local level, hence each member can interact with all others. Other occupations contain large numbers of incumbents. In these cases each member may interact with only a portion of others in that occupation. And, of course, some occupations place more emphasis on contacts (such as lawyers); The actual size of the effectively interacting group varies but will usually be relatively small.

The final assumption involves men who change occupations during their careers. If an individual changes occupations we assume that he maintains contact with the interaction group in his old occupation, while at the same time he is imbedded in a new interaction group in his new occupation. Further, we assume that the intensity of the initial set of contacts decays with time, depending on factors such as physical location, amount of prestige shift, and so forth.

With these three assumptions - that each occupation comprises a potentially interacting group; that any member of the group will only have contact with a limited number of others in the group; and that this occupational contact is maintained for some time when a member moves to a new occupation - we are ready to approach the concept of situs.

As mentioned, the thrust of research into situs is directed at specifying a nonprestige dimension of the labor market that would be helpful in understanding the stratification process. The original definition included the idea of identifiable, interacting groups. With these assumptions, situs can be defined in terms of an occupation's network connections with other occupations.

An individual who moves from one occupation to another establishes network ties between the two occupations. These ties facilitate the transfer of information between the two occupations. Since it seems that the majority of job changes that occur are based on this type of information, when any two occupations are connected in this way the chances for further movement between them will of necessity increase.

This logic can be extended beyond simple pairs of occupations. While an individual moves from one occupation to another and maintains contact with men in his old occupation, some members of the new occupation will have come from some still third occupation. Since this third occupation might also be linked via networks, then all three will be related in terms of information flows. When seen in this way, the entire labor force could conceivably be connected. Recalling Granovetter's (1974:56) suggestion that contacts beyond chain length two are generally ineffective, for research purposes the network contacts ought to be truncated to consist only of those occupations that are at most two links removed from any occupation examined.

Occupations that are connected in this way would, for the individuals involved, only be temporarily related. Since network connections tend to decay due to lack of involvement or lack of physical contact with members of the old occupation, the information link must be utilized to insure that the network contacts are maintained. If one individual moves to a new occupation and no vacancies occur in either the old or the new occupation for some length of time, network contacts will eventually die out, breaking the tie between the occupations. If there is consistent movement between the two occupations, the network contacts will be strengthened, a circumstance leading to the possibility of even greater interchange between them.

Fischer (1977:51) indicates that for most males, friendship ties tend to exist for only a limited length of time, somewhere between four and thirteen years. Due to the turnover that would occur when new friends are made and older friends dropped, occupations cannot be grouped into particular invariant categories based on network contacts. We must conceive of occupations as being connected to others by networks for only a limited period of time. Consequently, each occupation must be examined for its current degree of contact with others to determine the extent of its information network.

With this background, we are ready to redefine the concept of situs. In this definition, situs is viewed not as a series of categories, but rather as one component of an occupation which may vary over time. Each occupational situs would, for a particular period, and in a particular environment, include the occupation specified, all occupations directly connected to it by career mobility, and all occupations connected to these in the same way. Situs, then, will be defined as the information- sharing component of an occupation encompassing both itself and all other occupations connected to it by effective networks.

This definition meets both the initial criteria of Benoit- Smullyan and the concern for some nonprestige criterion by which to specify occupations. Other basic criteria should also be addressed.

Since we have defined situs in terms of interacting groups, Benoit-Smullyan's specification to that effect is not problematic. The second specification, that a situs be identifiable, requires some exploration. Situs has been specified as one component of occupation. Occupation itself is identifiable, but since we are specifying the mobility component, this too must somehow be identified with a particular occupation. This is the case because each occupation can be perceived in terms of the mobility chances of its incumbents. When seen in this way, occupational groupings would result, the groups being defined in terms of mobility possibilities. Thus, for example, occupations seen as "dead-end jobs" would form one grouping, and ones with "good potential" another.

The definition of situs also addresses the nonprestige criterion. In and of itself, the definition has no prestige connotations. It is, however, more than likely that many occupations of similar prestige will tend to be linked, thereby forming effective networks. Indeed, this is a positive aspect of the concept in that it may give additional insights into prestige movement.

How can this conceptualization of situs aid in understanding the process of stratification? We have so far specified this concept in terms of career mobility. Once situses are determined for a set of occupations in a local labor market, the groupings could give us additional insights into, among other things, intergenerational mobility.

The family plays a major role in the initial placement of a son in the occupational structure. Granovetter (1974) noted that around 70% of initial job entrants first heard of the opening from a family member. If we operationally define the family as the father, as most stratification studies do, then the information available to the father would be a prime determinant in the son's placement. The information available to the father would, in network terms, come from the father's workplace and friends. The most salient information will be about the father's specific occupation, followed closely by additional information routed through the other network contacts available to him or to other members of his occupation. The specification of the father's network should increase our understanding of why the son enters the labor force in a particular occupation and at a particular prestige level.

The above discussion has been presented strictly in terms of occupational connections. However, the previous chapter noted the varied ways that networks could be established. The family network has been dealt with above; Considerations of the spatial and educational networks must follow. Instead of detracting from our conceptualization of situs, these areas can be described in such a way as to highlight the importance of network contacts.

The educational networks that would be formed are, in one sense, the exception that demonstrates the point. Persons graduating from college often move a considerable distance to their first occupation. It is also usually the case that contacts are not kept with the individuals who formed the person's network while in school. However, it is not an infrequent occurrence that a graduate transfers occupational information to one of his old classmates years after they have separated, even though spatial and occupational contacts are lacking.

Most colleges have formed alumni associations to insure that their graduates remain in contact with their alma mater and with one another. In this case, an organization has been formed the net effect of which is to maintain the networks that would otherwise decay with time.

Spatial networks are also important for transmitting vacancy information. Two facets of this type of network must be considered. The first is based on the location of the workplace. If two factories are located side by side, the workers can be expected to live in close proximity, thereby allowing free information flow and, all other things equal, a large amount of movement between the two factories. If one of the factories is moved a significant distance, there would still be a large amount of movement initally, but this would slow as the information links parted.

The second spatial characteristic is based on the residential location of the individual. Where a person lives and relaxes will influence the extent of his mobility information. Since these are both structured by the segmentation of the labor market, the information available within any spatial location would be limited to occupations which are somewhat similar in nature. Within these areas, contact will usually not be so frequent as in an occupational setting, and would not be utilized as often, due to the short-term nature of vacancy information. When other sources of information are not available the spatial connections can obviously serve as an important information source. This is especially true if the situs of a person's occupation is small, or connections weak.

Within all of these possible network connections, the occupational network, situs, is by far the most important due to the short-term nature of most vacancy information. In the study of intergenerational mobility network information is mediated through the family. In the next several chapters we build up to a test of the situs idea. We first explore career movement to determine the situs groupings that exist. Then we explore the characteristics of the father-son traces and the structural changes that took place in the Portsmouth labor force. Finally, we use these situs groupings to determine if our conception of situs may be supported.

PART THREE

ANALYSIS OF THE DATA

INTRODUCTION

To examine the influence of situs on intergenerational mobility a cumulative data analysis process is called for. In previous chapters the data base and the industrial and demographic characteristics of the city of Portsmouth have been examined. A theoretical perspective on situs and network connections has also been discussed. Within the framework set by these discussions, this part of the study explores the data and builds to a test of the concept of situs.

In the first chapter in this part, intragenerational or career mobility is examined. In this chapter, career movement in four twenty-year periods is examined to determine which occupations were connected by frequent career moves. The various occupational connections found through this procedure are used to determine if the son appears in the situs of his father; if both father and son are in occupations which are connected by career moves, the son is considered to be in the situs of his father.

In the next chapter the focus changes to intergenerational mobility between fathers and sons. Both the procedures used to determine these traces and patterns that exist within this group are discussed. There is, as will be seen, a problem with our data inasmuch as all sons who are traced are men who remained within the community for at least twenty years. Consequently, the analysis pertains to only a select group of men - the most stable in terms of geographic mobility.

Comparing sons who are in their fathers' situs and sons not in their fathers' situs, the next chapter in this part discusses preliminary findings about the influence of situs on intergenerational mobility. We will argue that situs does, indeed, channel intergenerational mobility. Concluding this chapter, the father-son trace data will be presented in a form that will allow for an even more detailed analysis.

The last chapter in this part (Chapter Eight) presents a specific methodology used to test for the influence of situs and proceeds to examine whether or not the situs concept can be supported by testing various hypotheses. In this process, the concept of situs is supported. We will also see that when sons remain within their fathers' situs, their prestige is equal to or less than their fathers', indicating that when network connections are utilized for job placement, the existing inequality structure tends to be perpetuated.

CHAPTER FIVE

THE DETERMINATICN CF SITUS

The task of this chapter is to determine the intergeneraticral cr career interconnections that existed during the period covered by this study. The concern is with the pattern cf movement of all men within the labor force and not with particular individuals inasmuch as situs has been conceptualized as a structural regularity. And the concern is with the occupational careers of men because it is within careers that the network connections are made which serve as mobility channels for new entrants into the labcr force.

A propcsition may be generated from the network chapter that we can use as the basis for our determinaticr of situs connections. This prcposition is simply that the more two occupations exchange members, the greater will be the informaticn flcw between these occupations. Since occupational networks channel vacancy information, the degree of membership exchange between two occupations can indicate the existence of information sharing networks cf this type. Using this prcpcsiticn, situs connections for the entire labor force may be determined (see also Spilerman, 1977).

The data used tc determine these networks are the career traces generated from our total data set. Tc produce as much informaticn as possible from this total set, and to match our intergenerational traces (Chapter Six), occupational connections are examined in four overlapping time periods: 1850 to 1870; 1860 to 1880; 1870 to 1890; and 1880 to 1900 (see Chapter One). Within these periods unique names were traced between each pair of data years. When a name appeared more than once in either the source or destination year, all occurrences of that name were excluded. When a unique name was traced between years, it was considered an accurate trace because ages are always unavailable in one of the two years (see Chapter One). With this procedure, a file for each pair of years was produced which contained the traced men's source and destination occupational codes. These files are the career trace sets, and will be referred to as career sets.

Several cases were dropped from these career sets because one or the other of the two reported occupations obviously resulted from the coding problems discussed in Chapter One. There were cases, for example, of movement from an occupational code to either an in-school or too-young-for-school code. Incongruos matches of this type averaged 1.3% for all pairs of data sets. Table 5.1 presents the number and proportions of men traced between each pair of years in our total data set after such cases were removed.

The low proportions that occur in the 1895 - 1900 set stem from the problems with the overwritting of names on the original records (Chapter One). The lowest tracing rate, however, occurred in the 1864 - 1870 set, a reflection of the

Table 5.1
Career Traces
Males

Year Pair	Number Traced	Base Size	Traced Proportion
1850-1856	1148	1979	.5801
1856-1860	1215	1979	.6139
1860-1864	1577	2796	.5640
1864-1870	1278	2796	.4571
1870-1875	1441	2496	.5773
1875-1880	1574	2496	.6306
1880-1886	1721	2897	.5941
1886-1890	1953	2897	.6741
1890-1895	2152	3526	.6103
1895-1900	1818	3526	.5156
Average	1588	2739	.5798

The base number in all cases is the smaller of the two bases in the pair. Proportion is based on this number.

inflated size of the labor force during the Civil War. High rates occur when matching from directory to directory (1886 to 1890 and 1890 to 1895), and with the small base size in the 1850's.

After traces between pairs of years have been identified, the various career sets can be combined into four larger twenty-year sets that correspond to our intergenerational traces (Chapter Six). In these sets we further deleted occupational pairs which contain any "non-occupational" code; student (110), retired (120), unclassifiable (130), in school (333), and missing (999). These codes were excluded because they do not even nominally meet our assumption that occupations are interacting groups (Chapter Four). Table 5.2 shows the total number of occupational career traces obtained for each of these periods.

Table 5.2
Total Career Traces
By Data Period

Period	Total	Total Excluded
1850 - 1870	4920	298
1860 - 1880	5510	360
1870 - 1890	6339	350
1880 - 1900	7188	456
Average	5989	355

When individual traces are combined in this fashion, it is certain that some men will be included four times, others only once. Still others, who are not reported or who leave the community prior to a census or directory canvass, are not included at all. The general effect of this pattern is probably toward occupational consistency - the longer a man remains within the community, the more likely that he will not change occupations (except in a normal career progression - the level of aggregation used in this study will not usually differentiate these changes). This pattern will have a suppressing effect on the ability to determine situs connections inasmuch as our concern is to use occupational movement to determine situs connections.

Traditionally, the method most frequently used to present and manipulate source-destination data of this type is a matrix. For these four career sets the matrices each contain about 70 rows and columns (dependent on the number of occupations reported), with ordered row and column headings.

The actual ordering of the headings - occupational titles - is arbitrary in view of their nominal nature. However, the same ordering was preserved for each set.

These matrices have some unusual characteristics. Most matrix-based research in mobility deals with matrices that contain less than 300 cells (Hauser and Featherman, 1977; Breiger, 1981). Our matrices, however, contain between 4,096 and 4,900 cells each. This enormous size and the way men move between occupations during their careers makes analysis difficult.

A major problem with the data in matrix form is cell density. The actual number of career traces ranges from 4,920 in the 1850 to 1870 set (1.2 traces per cell) to 7,188 in the 1880 to 1900 set (1.5 traces per cell). On average, there are approximately 1.3 traces per cell in all four sets. This small number makes analysis using any of the chi-square-based statistics unreliable (Loether and McTavish, 1974).

In addition to this problem, the actual size of each cell in the matrices varies to a large degree. On the diagional, the number of traces ranges from zero for some cells to almost 700 for others. Off the diagional, values range from zero to near 100 traces per cell. This variation results primarily from the variable number of incumbents in each occupational category (Chapter One). This variation in cell size seriously hampers most conventional analytic techniques.

Finally, the way career mobility is patterned makes conventional analysis difficult. Most men's work histories include long periods of time in one occupation. Because of this, the diagional entries in each matrix - cells that indicate immobility - contain some 60% of all traces. Consequently, the actual number of traces between different occupational categories is relatively small.

To determine the strength of occupational connections three conventional techniques were explored but all were found inadequate for our needs. Conventional network analysis (Marsden, 1981), since it requires the conversion of the matrices to a series of ones and zeros (ones specifying a connection of any amount), yields information only on which occupations are connected and which not, and gives no indication of how strong this connection is. This technique does not produce useful information for our purposes.

Cluster analysis (Everitt, 1977; Bailey, 1974) was also attempted. This technique, which looks at the raw numbers of cases in each cell on a row-by-row basis, was found to yield results that were seriously distorted because of the large variation in cell size. All occupations with a small number of reports connected in any way to an occupation with a large number of reports form the basis for the clusters. In this case, the variable size of the occupational groups biased the results and made them unreliable.

Finally, we utilized the inflow/outflow analysis frequently found in conventional mobility studies (Miller, 1960; Glenn, Ross, and Tully, 1974). In this procedure the proportion of movers from one occupation to another forms the basis for the connection. Again, all occupations with a small number of traces were found to have the strongest connections, and occupations with large numbers of traces were only weakly connected. The structure of our data again stands in the way of usable results.

Since these conventional techniques failed to yield reliable measures of connection an alternate procedure, based on our original proposition, was developed for the determination of situs groupings. This procedure uses the proportion the number of exchanges between two occupations are of the average size of the same two occupations. By averaging, the problem of variable group size is alleviated to some extent, although we still find some sensitivity to size when occupations with highly disparate numbers are combined. Additionally, this procedure does not manipulate a matrix but involves simple pairs of occupations.

We are concerned with the number of times the two occupations in a pair are reported, not with the average number of reports for each occupation. This is an important distinction because our basis for averaging is source and destination size combined, not simply the average size of the two occupational groups. We are concerned with the total number reported because this indicates the relative size of those groups at risk of receiving and acting on vacancy information. But a problem is evident when we combine two occupations that are connected by men moving between them, for those who do move, among others, are counted twice, a circumstance artificially inflating the average size of the pair.

An extended illustration will make this point clear, and serve as a complete description of this measurement procedure.

Consider the simplified matrix below (Figure 5.1).

Figure 5.1
Hypothetical Data Matrix

		DESTINATION			
		X	Y	Z	Total
SOURCE	X	a	b	c	j
	Y	d	e	f	k
	Z	g	h	i	l
Total		m	n	o	p

The letters in this figure correspond to the descriptions given below.

Table 5.3
Description of Code Letters for Figure 5.1

a,e,i	Diagional cell entries (immobiles)
b,c,d,f,g,h ...	Non-diagional cell entries (mobiles)
j,k,l	Source (row) marginal totals
m,n,o	Destination (column) marginal totals
p	Grand Total
X,Y,Z	Occupational Titles - note they are the same for both source and destination.

The first point that should be noted about this matrix is its symmetry. Information travels through the individual, hence if an individual changes jobs information can either go in the same direction as the move, or it may move in the reverse direction (Chapter Three). Information about vacancies can usually be acted on in either direction unless some barriers (credentials, certification or experience to name a few) exist to block the movement.

From the matrix in Figure 5.1, we examine the hypothetical connection between occupations Y and Z. Since we are dealing with two occupations at two time points (source and destination), to determine the average number of reports of these two occupations we would conventionally add both row marginals (k and l) to both column marginals (n and o), then divide by two. The result would be the average number of men in these two occupations for the period covered by the matrix. In doing this, however, we are actually counting four values in the body of the matrix twice (e, f, h, and i). Values e and i are the immobiles, whose values appear in both row and column marginals for their respective occupations. Values f and h are the number of men who moved between the two occupations, so their values are included in each marginal for both occupations.

In view of this double counting, to arrive at an accurate representation of those at risk of exchanging members we sum the marginal values and subtract the values e, f, h, and i from this total. We divide the remainder by two and the result is the average number in the two occupations who are at risk of receiving any available vacancy information. To keep this figure distinct, we will refer to it as the mobility interaction base number.

It should be noted that this procedure does not work when dealing with immobility, where both source and destination occupations are the same. For determining the average number of men at risk of being immobile, simply sum the row and column marginal, subtract the (double counted) diagional, and divide by two. This number is the immobility interaction base, a number measuring an occupation's connection to itself.

Once the interaction base number is determined for a pair of occupations we can determine how closely connected they are. We first determine how many traces occurred in either direction between the two occupations (or, in the case of immobility, the number who were immobile). In the above matrix (Figure 5.1) this would be, for occupations Y and Z, the values h and f. We add these values, and then divide the interaction base number into this sum to arrive at the proportion the traces are of the interaction base. This proportion then serves as our measure of the degree of connection between the two occupations, a number called the linkage index.

Again referring to Figure 5.1: The letters there are used to work through the procedure step-by-step.

Table 5.4
Summary of Steps to Arrive
at the Linkage Index

Step 1.
Determine the total size of the two occupations (Y and Z) in the pair:

Total Size = (k+ l+ n+ o)

Step 2.
Determine the interaction base number by subtracting out all values that were double counted and dividing the remainder by two:

Interaction Base = (Total Size - (e+f+h+i))/2

Step 3.
Determine the total number of traces between the pair:

Total Traces = (f+h)

Step 4.
Determine Linkage Index Proportion:

Linkage Index = Total Traces / Interaction Base Number

Since we are dealing with pairs of occupations, the value of the linkage index may vary from zero, where there is no connection between a pair of occupations, to two, where an entire source moves to one destination and makes up the totality of that destination. A further division by two would force the linkage index values into a zero-to-one range. However, we decided against this in order to highlight the fact that this is simply an index value, and not a statistical test.

This linkage index value serves as a measure of our original proposition: That the more two occupations exchange members, the greater will be the information flow between them.

Prior to a discussion of the results of this procedure a few words of caution about the linkage index. First, it is a crude measure, serving primarily as an indicator of probable connection. Many actual connections are obscured because of the necessity to average, especially when two occupations of greatly different sizes exchange members. However, the technique highlights connections that would be totally lost using conventional methods.

Second, immobility, always a concern in mobility analysis (Goodman, 1981; Breiger, 1981), poses somewhat of a problem. In the linkage procedure the immobiles have been included in our base figures, assuming that even though they do not move, they were at risk of moving. An alternate procedure would be to exclude them from analysis and address only those who actually changed jobs. Although this procedure would increase the values of the linkage index, we have decided in favor of a conservative approach.

Finally, a problem develops in the interpretation of results. What value of the linkage index indicates an effective connection? In one sense any non-zero value indicates a connection and thereby the possibility of the transfer of vacancy information. However, we do not wish to examine every connection as only the strongest indicate the utilization of channels. Due to the crudeness of our measure, predicting a monotonic relationship between the size of the linkage value and actual movement is not possible. We feel, however, that these linkages give us a reasonable idea of where most movement will occur.

What value of the index indicates an effective situs connection? No information could be found in the literature that would indicate the size of information-sharing networks at the workplace, hence our only alternative has been to estimate such a number. We assume that an information-sharing network at the workplace ranges between 10 and 15 men and for our purposes, we will use a point estimate of fourteen men in these networks. Therefore, since the linkage index indicates the proportion of movers in a pair of occupations, index values of .036 or greater (meaning one man in 28 in the pair of occupations or one man in 14 for each occupation in the pair) are assumed to indicate an effective connection.

When our data bases are analized using the linkage procedure the result is a list of all pairs of occupations that are connected, and their respective linkage index values. Since the analysis is symmetric, each pair of connected occupations is listed twice, once with one of the pair as a source, and once with the same occupation as a destination, both with the same linkage index value. One of the two reports for each pair of occupations may consequently be eliminated. The remaining pairs form the basis of our analysis.

Even when those index values that fall below our definition of an effective connection (.036) are eliminated, a list is a poor way to present the results. We have postulated that network connections can be either primary (where two occupations directly transfer information to each other) or they can be secondary (where vacancy information in occupation X is known from network contacts to a member of occupation Y, who transmits it to a person in occupation Z). Due to this feature of our conceptualization of situs, the most effective presentation is in the form of a flow chart.

Figures 5.2 - 5.5 present the results of this linkage procedure on each of our four career sets in flow-chart form. Table 5.4 describes the major features of these charts.

Table 5.6 presents summary information about the figures. Base year refers to the first year examined in each linkage figure. Number of occupations indicates the total number reported in the figure. Number of direct connections refers to the number of direct career connections established on each figure. Total men traced is the total number of men who were reported in any occupation on the chart at any time as a source (they were all traced to some subsequent occupation). Immobile men are those who remained in their occupation between any two time points. Direct connection movement indicates the number of men who moved to directly connected occupations (these moves are used to determine

Figure 5.2
Linkage Chart
1850 to 1870
Career Connections

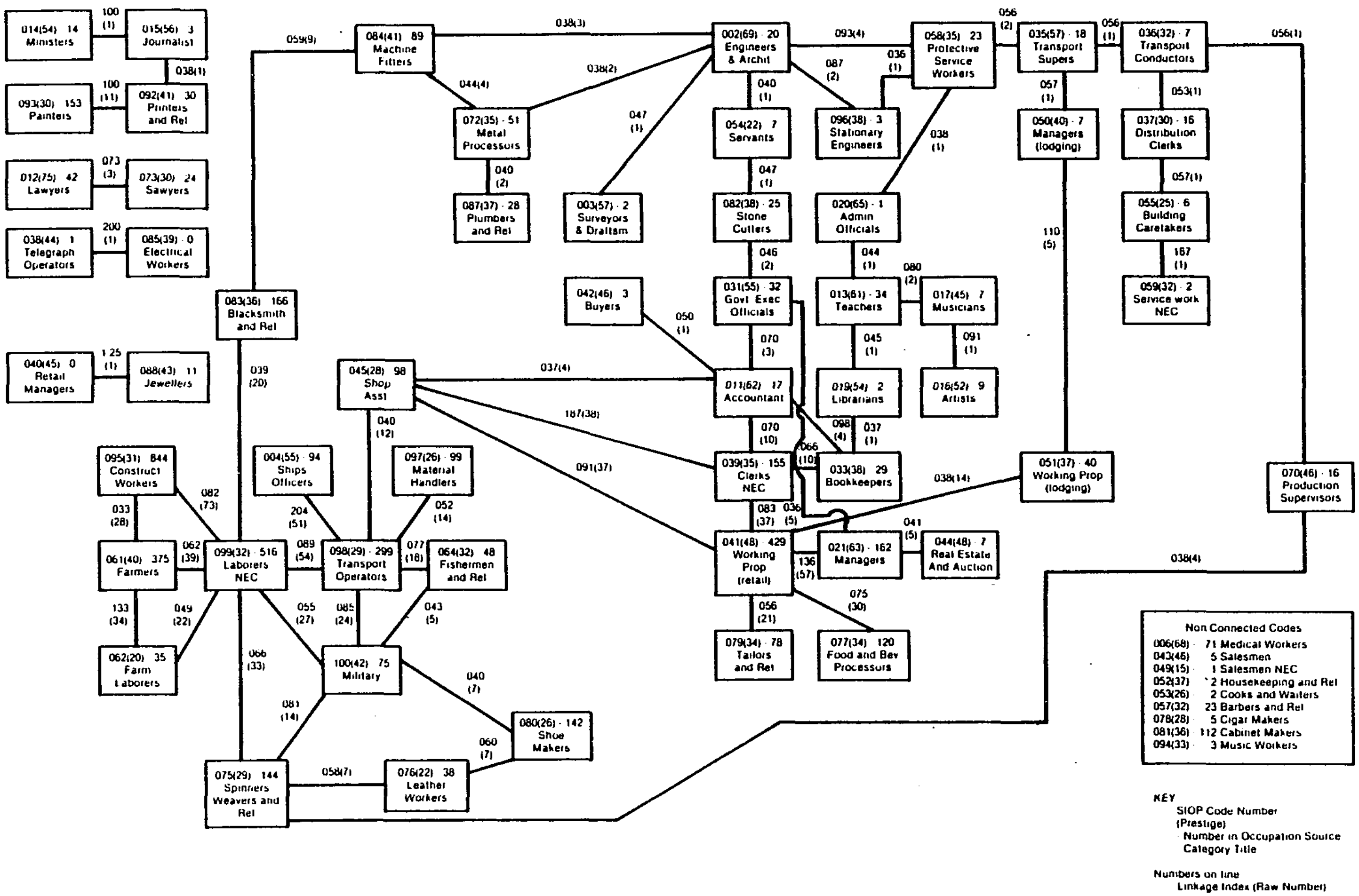


Figure 5.3
Linkage Chart
1860 to 1880
Career Connections

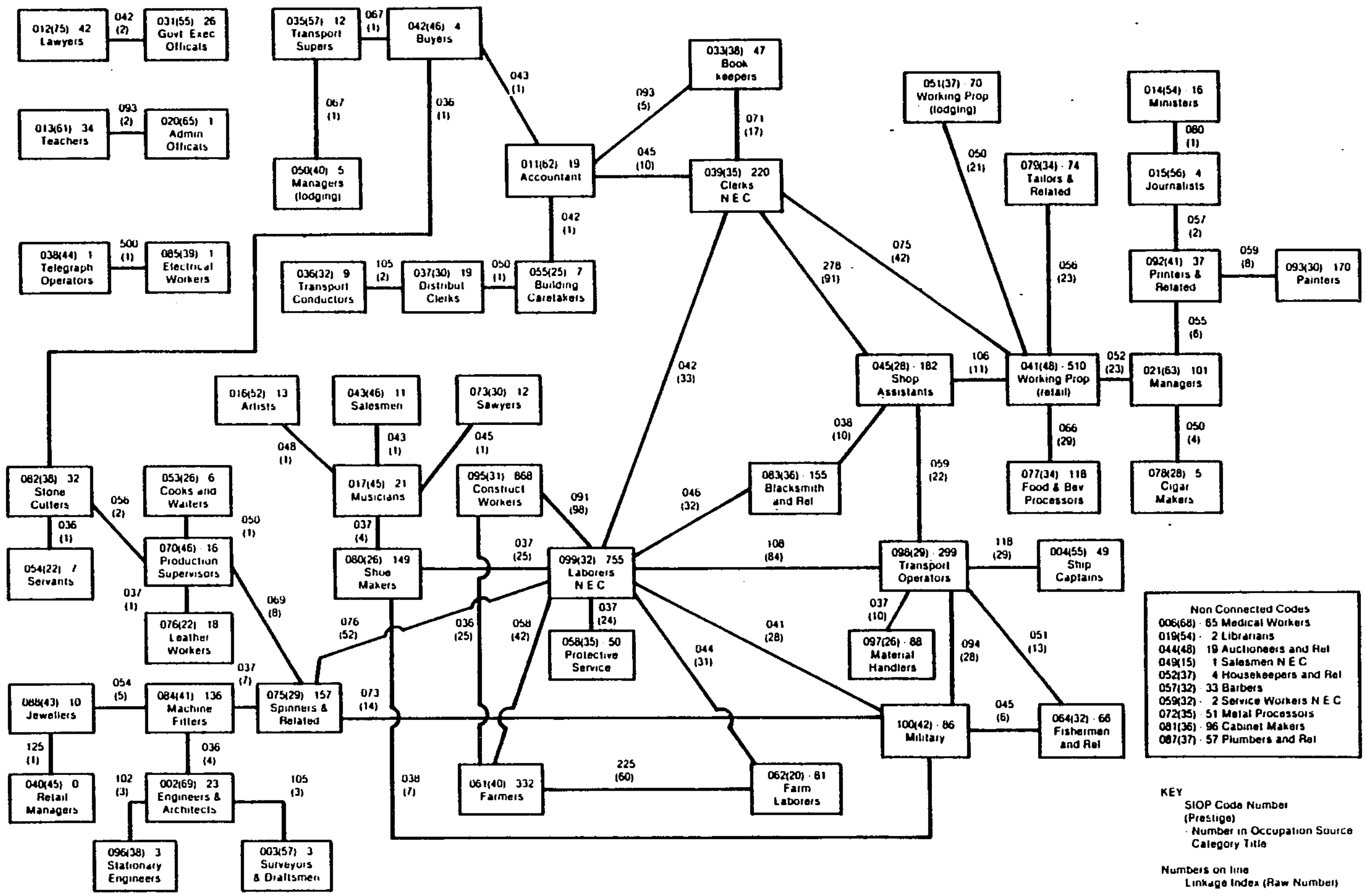


Figure 5.4
Linkage Chart
1870 to 1890
Career Connections

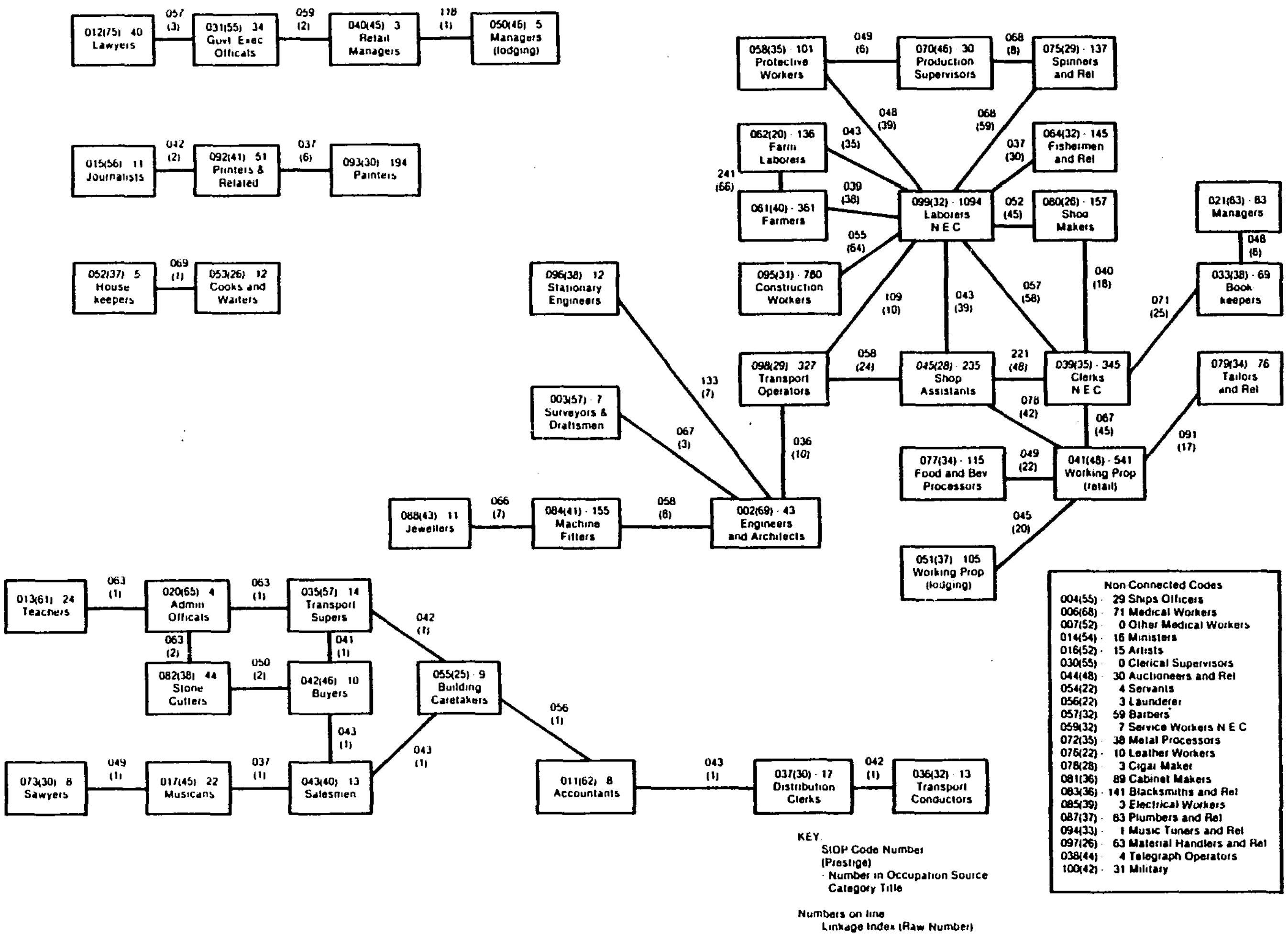


Figure 5.5
Linkage Chart
1880 to 1900
Career Connections

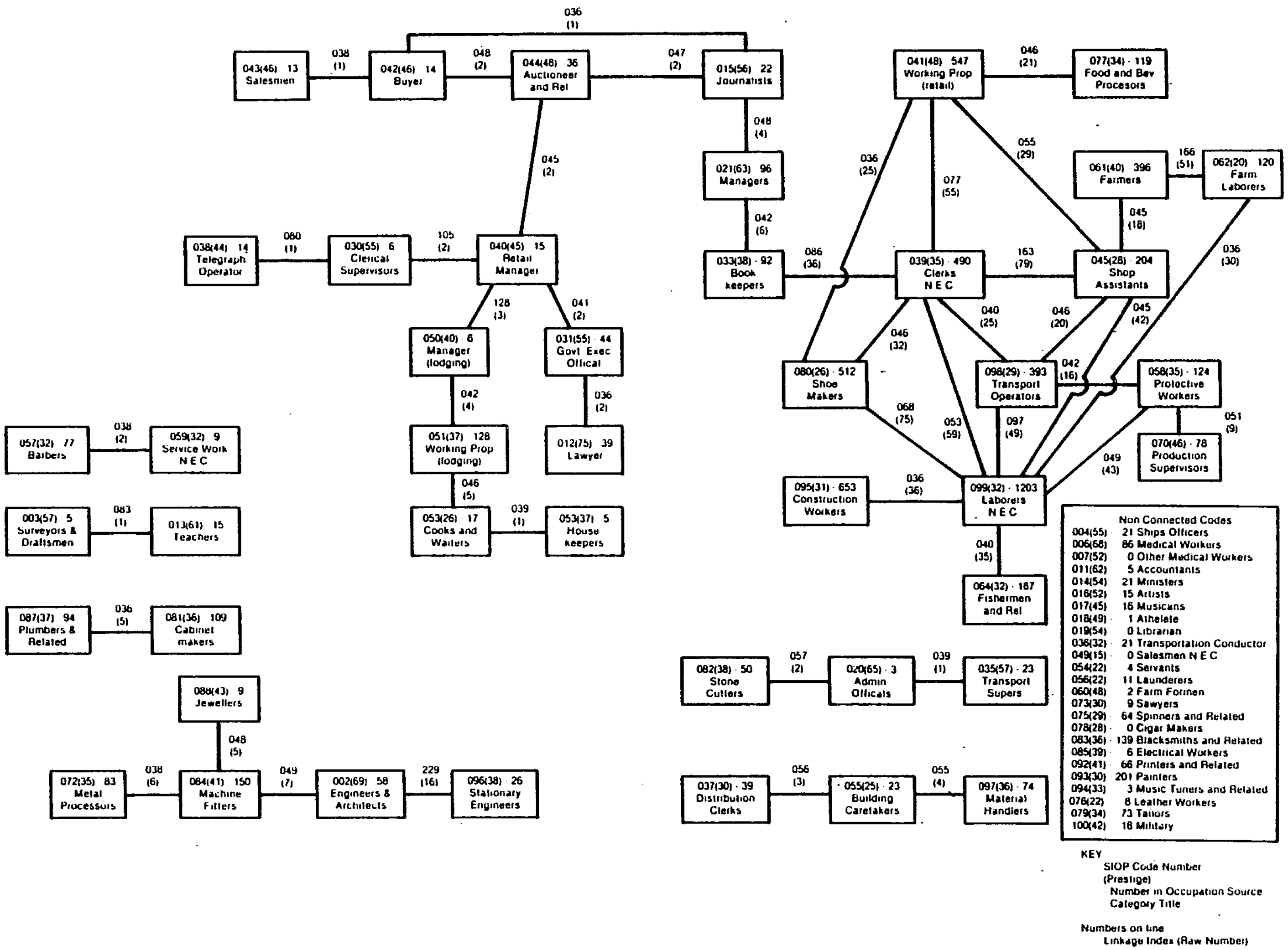


Table 5.5
Features of the Linkage Figures

Box -

Each box represents a single occupation. Within the box itself the following information is found:

a) The occupation's SIOP code number (first number on first line in box)
b) The occupation's prestige score (in parentheses)
c) The number of men reported in the occupational source (last number on first line)
d) The occupational title

Lines -

Each line indicates an effective connection. Placed near each line is the following information:

a) Linkage index value (always includes a decimal point)
b) Raw number of moves in either direction (in parentheses)

Listing -

Included on each figure is a listing of 'non-connected' codes which are occupations that were reported but were not effectively connected to any other occupation. Number sequences on these lists is the same as in the 'Box' section above.

Interpretation -

If two boxes are directly connected by a line, they are in each other's primary network. When a line indirectly connects two boxes, and only one box intervenes, then the two occupations are in each other's secondary network. Otherwise, the boxes are assumed to be unconnected by information links.

effective connections). Other movement refers to any other type of career move.

Figures 5.2 through 5.5 may be seen as maps of the occupational structure of Portsmouth, indicating the patterns of career movement that existed during the periods specified. All occupations reported on these figures may be considered to have some situs component. Those within the body of the figures are occupations where there was effective movement between different occupations, as well as occupational

Table 5.6
Linkage Summary Information
To Accompany Figures 5.2 to 5.5
Career Interchanges and Consistency

Base Year	Number of Occups.	Number of Direct Connects.	Total Men Traced	Immobile Men	Direct Connection Movement	Other Movement
1850	65	67	4920	2945(60%)	829(17%)	1146(23%)
1860	66	61	5510	3061(56%)	917(17%)	1532(28%)
1870	66	47	6339	3734 (60%)	1066 (17%)	1539(29%)
1880	70	46	7188	4483(62%)	872(12%)	1833(26%)
Ave.	67	55	5989	3556(59%)	946(16%)	1513(25%)

consistency for some members of these occupations (i.e., at least one man stayed in the same job for at least five years). Those occupations listed as "non-connected" are, in fact, connected to themselves by incumbents remaining in the occupations over time (Chapter Three). They are referred to as non-connected simply because they have no connection to other occupations; the situs of these occupations extends only to themselves.

In this work, the main concern is with the impact of situs on intergenerational mobility. Although a number of interesting connections - and lack of connections - appear in these figures, they are not discussed here. For our purposes only the broadest patterns are of concern.

In each of these diagrams, a number of similar groupings appear. One group appears in each set centered on occupational code 099, laborers not elsewhere classified (n.e.c.). This can be seen most clearly in Figure 5.2 (1850).

An additional grouping appears with code 041, working proprietors retail, perhaps most clearly seen in Figure 5.3 (1860). Other groups centered on other occupations can also be seen. However, four deserve special attention. They are;

a) Painters (092) and printers (093)
b) Lawyers (012) and sawyers (073) (1850 only)
c) Engineers and architects (002) and stationary engineers (096)
d) Clerks n.e.c. (039) and shop assistants (045)

Although these four pairs of occupations have high index values, the numbers are probably not reflecting real career moves but rather spelling errors and differences between the reporting of occupations in the census and directories (Chapter One). Only in the case of clerks and shop assistants, two somewhat similar occupations, is the reported index value assumed to be a reflection of an actual career linkage, although these may actually be different titles given to the same occupation.

Little career connection is reflected in these figures between the non-manual (codes 000 - 049) and manual (codes 050 - 099) occupations (except for codes 077, food and beverage processors, and code 079, tailors, occupations which are very similar to working proprietors (code 041)). This is a reflection of the influence of first job on a man's mobility. Obviously, moves between these two broad sectors did take place but they do not seem to follow any but a few regular patterns, such as the connection of some manual occupation with shop assistants or clerks n.e.c. in all figures. The next chapter suggests that many of the low prestige non-manual positions were taken by younger workers first entering the labor force, who thereby made fewer positions available to those who already had jobs.

From these figures the type of situs inheritance may be determined for each father-son pair in our intergenerational traces. First, all sons who are reported with the same occupational title as their father are given a specifying number. Next, all sons who are reported in an occupation directly connected to their fathers' on these figures are given a code number which specifies that they are in occupations directly connected to their fathers'. Finally, all sons whose occupation can be traced by two lines to their fathers' occupation are specified as being in their fathers' secondary network. All remaining sons are classified as not in their fathers' situs.

This is a cumbersome procedure, but acceptable when dealing with the number of intergenerational traces that we have obtained. It is relatively simple, yet yields all of the information that we want from the career traces.

It should be re-emphasized here that the basis for situs connection is the movement of men during their careers between the various occupational categories in the labor force. The individual careers of fathers whose sons are traced are not used to determine if their sons are in their situs. Rather, the network-connected group within which the father's occupation is found determines whether or not a son is within his father's situs group.

In the next chapter the intergenerational traces found within each of these situs groupings are explored. Using these as a base, we then examine a number of specific hypotheses about situs mobility, demonstrating that the concept does indeed suggest a possible mechanism of occupational stratification.

CHAPTER SIX

INTERGENERATIONAL MOBILITY PATTERNS

This chapter examines the intergenerational traces derived from our data sets. First, the intergenerational tracing procedure is discussed, specifying the rationale for the procedure and the procedure itself. The mobility data obtained through this procedure are then examined, with attention to the basic data for the entire population and to the historical development of the community.

With mobility in mind, the distribution of both fathers' and sons' prestige will be examined for evidence of changes in the occupational structure. The proportionate distributions of the nominal occupational categories will also be explored as another way to view changes in this structure. Finally, a comparison of these procedures will give an indication of both the amount and direction of change in the occupational structure during the fifty years covered by this study.

The purpose of this chapter is to document the particular changes that occurred in the occupational structure of Portsmouth from 1850 to 1900. During this time the community was in a constant state of flux. Consequently, the dynamics of this change must be specified to understand why particular patterns of occupational mobility occur. The discussions found in this chapter will be used extensively in our subsequent analysis of situs contacts.

Section I - Intergenerational Tracing

In our tracing of father-son pairs we rely on five variables: year, name, age, relation to household head, and family number. The particular procedure used is straightforward but certain aspects of it must be discussed at length, most notably the time frame chosen (discussed more fully later). For the tracing procedure, only four of our data years (1850, 1860, 1870, and 1880) contained information on relation to head of household, hence these four serve as the base years for our analysis. Consequently, this analysis is restricted to a fifty-year period, 1850 to 1900.

For each base year, a subset of fathers (relation to household head code 1 - Chapter One) was obtained, containing, for tracing purposes, family number and year. Each family number was then used to determine if any sons (relation to household code 2) appeared in that family. If one or more did appear, information on that son (name and age), and his father (age, occupation) was written on another computer file. We then took the son's exact full name (last, first, and middle) and determined if it appeared in a destination data set (1870, 1880, 1890, or 1900) twenty years beyond the base year.

There were three possible outcomes of this procedure. The first was that the son's name did not appear. In this case, we simply went on to the next son's name on our base list. The second outcome was that we found more that one case of the same name in the destination year. In this event, we dropped the name from our list, being unable to obtain an unambiguous trace, and went on to the next son's name on our base list. The third outcome was that the son's name appeared but once in the destination year. This was considered a probable trace.

With each probable trace we performed one final check to determine if the trace would be accepted. If the age of the son in the destination year was equal to the age of the son in the base year, plus twenty years (plus or minus 3 years due to inaccurate reporting), or if age information was incomplete, the trace was accepted as accurate.

Each accurate trace was then placed in a trace file with father's occupation and age, then son's occupation and age. If a father had three sons who remained in the community for the 20-year period, the father's age and occupation would be reported three times, and each son's once. This is acceptable because we are concerned with the father's influence on his son or sons, so when more than one son is traced, the father would have had more impact on the destination year, and his occupation should be reported more than once.

When this procedure was completed for each base year, one pass through the trace data was required to set the file up for testing. This involved adding on the occupational prestige to both fathers' and sons' occupational codes. Additionally, when either had a non-occupational code (missing and the like - Chapter One), the entire string was discarded. For every son traced, the final files, called trace sets, contained the information listed below.

a. Father's occupational code (in base year)
b. Father's age (in base year)
c. Father's occupational prestige
d. Son's occupational code (in destination year)
e. Son's age (in destination year)
f. Son's occupational prestige

Prior to examining the results of this tracing procedure we should explore some of the ramifications of this twenty-year time frame. Primarily, this span was chosen to derive as much information as possible from our data sets. Additionally, twenty years allows sufficient time for a son to enter the labor force and establish himself in some occupation. Longer periods would show less situs influence as the sons would be pursuing their careers based on information other than that received from the father. Shorter periods would have decreased the number of sons traced to occupations.

Two disadvantages of this procedure both involve age. Age is an important variable in stratification research. A consistent finding has been that age is positively correlated with occupational rank (see Duncan, 1966; Featherman and Hauser, 1978). Many investigations in the field use age as a central criterion for determining occupational information (Duncan, 1975). With our procedure we are not controlling for age. Consequently, the first disadvantage of this tracing procedure is that at the time their occupations are reported, fathers and sons are of different ages - the fathers being about 12 years older than the sons. This could lead to some problems in terms of occupational structure, the younger men having less time to acquire high-prestige positions.

The second problem involving age is that it is a biological process. The average age of all fathers in all of the trace sets is about 44 years. When we refer to the combined life table (Chapter Two, Table 2.7), we find that males of this age have a life expectancy of between 22 and 25 years. This means that about fifty percent of the fathers would die before the 20-year period had elapsed. When a father has died an alternate but similar process must occur for vacancy information to be transmitted. These problems are addressed more fully in the appropriate sections below.

Both of these age-related problems influence the data and decrease the visibility of situs in our results. However, with a 20-year interval these problems are minimized. A shorter time period would have allowed more fathers to remain alive, but would decrease the age of the sons. A longer time would have increased the age of the sons, but would decrease the number of fathers who remained alive and their influence on their sons' careers.

Section II - Characteristics of the Data Sets

The father-son traces that we are dealing with are not random samples. Consequently, we refer to these data as trace sets. To distinguish these from statistics based on the total reported active male labor force (Chapter Two), these latter groups are refered to as population sets.

The trace sets are structured to include all father-son pairs in four specific time periods. In the various tables to be presented in this chapter, base year refers to the fathers' distribution, and destination year to the sons'.

It will be noted that the trace sets overlap one another: The first set has a base in 1850 and a destination of 1870; the second set has a base in 1860 and a destination of 1880; and so on. This was done to achieve the greatest number of traces possible with the data set. No traces could be run from the base year 1890 because no relation codes are available for that year (Chapter One). Some sons were actually traced more than once; 3% of all sons were traced twice; less than .5% were traced three or more times. This small proportion means that their influence on the results will be minimal.

Table 6.1 presents the number of father-son pairs obtained for each trace set when using the procedures outlined above.

Table 6.1
Total Father-Son Intergenerational Traces

Base Year	Dest. Year	No. Traced	Proportion of Active Labor Force (Dest.)
1850	1870	295	.106
1860	1880	395	.125
1870	1890	369	.101
1880	1900	392	.105
	(Total)	1451	(Average) .109

Proportion of active labor force can
base year because of multiple father reports. See text.

The number of traces in each of the sets averages about 11% of the total active labor force in each destination year. The lowest percentage trace, 1870 - 1890, stems from two factors, one historical and one data-related. The data problem is that the 1890 data set is a directory (Chapter One), and directories tend to underreport younger males. The other problem, which also influences the 1880 - 1900 set, is that a major industry, the Kearsarge Cotton Mill, was destroyed in late 1880 (after the census was taken), and never reopened. This closing could have created conditions that would increase the probability of out-migration for the families affected.

The largest trace, 12.5% in 1860 - 1880, is more difficult to explain. With the Civil War (1861 - 1865) and a major depression (1873) intervening, this might be expected to be the set with the fewest traces. However, the average

age of sons in this set is 11.5 years in 1860, too young to participate in the war. The depression was national in nature, so perhaps the greater geographical mobility associated with economic decline did not play as great a role as would otherwise be the case.

The lowest raw number of traces, 1850 to 1870, can best be explained by the Civil War (these sons would have an average age of 21.4 in 1860) and the declining shipbuilding industry in Portsmouth during the 1850s; families affected by this decline might have had a greater probability of leaving the community.

In general, the number of traces between the data years is well explained by the historical context. It will be recalled that only sons who remain within the community for the 20-year period are being examined, so the proportions traced are adequate.

Another feature of interest is the average age of men reported in the trace sets. Table 6.2 presents the mean ages of the fathers, sons, and the total active male population for each data year.

In Table 6.2, notice first that the average ages for both fathers and sons generally increases over time, reflecting a general increase in longevity for the population as a whole (Chapter Two). On average, fathers are 32 years old when their sons are born. Sons are 12 years younger in the destination year than their fathers were in the base year.

Table 6.2
Age Characteristics
Males
Traced and Population

Base year	Dest year	Father age	Base pop. age	Son age	Dest pop. age
1850	1870	43.1	34.9	31.4	38.5
1860	1880	42.8	36.6	31.5	39.0
1870	1890	44.1	38.5	32.7	42.0
1880	1900	46.3	39.0	32.7	39.4
Average		44.1	37.3	32.1	39.8

Fathers' age is reported for the base year, and sons' age is reported for the destination year. To determine the average age of sons' in the base year, subtract 20 from sons' age.

Also notice that for all cases fathers' age is greater than the population average, and sons' age is less.

The fathers, having an average age of 44, would have an average life expectancy of between 22 and 25 years (Table 2.7, Chapter Two). This means that slightly less than half of them will have died before the destination year for each set. Many sons would have obtained jobs before the end of this twenty-year period, but once the father had died, it would be impossible for him to transmit vacancy information. However, father's occupation is being used as a stand-in for the influence of the family on the son. Consequently, vacancy information held by the father could also be held by some other relative or friend of the family, thereby allowing information from the father's situs to be transmitted to his son, even though the father was dead. Thus, while this information, having to filter through a number of different links, is transmitted with greater difficulty, it is still possible for it to reach the son, and to be acted on. This is especially true in the case where an occupation is directly inherited by a son (the ownership of a small shop, for instance).

Beside age, we may also compare the prestige of fathers and sons within the trace sets. Table 6.3 presents these figures.

Table 6.3
Traced Data
Prestige Averages

Base Year	Dest Year	Prestige Father	Prestige Son
1850	1870	37.2	35.1
1860	1880	35.3	35.0
1870	1890	34.0	36.6
1880	1900	34.9	33.8
Average		35.3	35.1

Prestige scores are based on minor groups in the SIOP scale.

The greatest downward shift in prestige between fathers and sons occurs in the 1850 - 1870 data set. This primarily results from the decline in shipbuilding. In 1850 there were many fathers who were reported as owners or managers of ship- or boatbuilding firms, a high prestige occupation (63 units). In all, 17 fathers, 7% of the entire traced set, were in this type of occupation. By 1870 shipbuilding had declined so that this occupational type comprised less than .5% of the labor force, compared to 3.5% in 1850. A discrepency can thus be expected because of the change in the occupational structure.

The one case where sons' prestige is greater than their fathers' (1870 - 1890), can be readily explained as due to the different nature of the 1890 data set. As noted in Chapter One, directory reports tended to be of occupations higher in prestige then were the census reports.

In all cases, the prestige differences between fathers and sons seem to be minimal. This comparison of prestige leads directly into the question of changes in the occupational structure.

Section III - Changes in Occupational Structure

One item of constant concern in mobility studies is occupational structure (see Udy, 1980; McCann, 1977; McClendon, 1977), that is the occupational or prestige distribution of the labor force at any point in time. Most researchers control for structural change (cf. Rogoff, 1953) and thereby look only at "pure" mobility, or mobility that cannot be attributed to differing occupational distributions. This is also a concern here because drastic changes in the occupational structure will heavily influence situs inheritance, as well as conventional occupational inheritance.

Occupational structure can be examined in two related ways. We may look at the distribution of prestige, inferring from this change in the prestige structure over time (see

McClendon, 1977). Or we may use a more general approach and compare occupational categories to see where major changes are occurring (see Jackson and Crockett, 1964; Hauser and Featherman, 1973). Here, both approaches are used, for, as will be seen, using two different ways to measure structural change yields information and insights that would be lost were only one method used. The occupational structure is first examined through prestige, then through the nominal occupational categories.

Prestige scores vary, in the SIOP minor groups contained in our data from a low of 15 to a high of 75, a range of 60 units. For all trace sets, both fathers' and sons', prestige distributions have a high positive skew, with a mode of 32 for all four sets combined. Individually they all exhibit a similar skew, but one set has a modal prestige of 31 (fathers, 1850), and one set has a median of 31 (sons, 1900). The only other variation from a mode and median of 32 are the sons in the 1890 data set. As mentioned earlier, directory years have a generally higher prestige report than do census years, and this is reflected in the mode - median pair of 35 for this year.

Table 6.4 presents the means and standard deviations of prestige for both the trace sets and the larger population. These measures serve as indicators of the community (the mean) and the extent of inequality present in that structure (the standard deviation).

Table 6.4
General Prestige Characteristics
Males
Trace and Population Sets

		Fathers				Sons			
		Mean		Stand. Dev.		Mean		Stand. Dev.	
Base Year	Dest Year	Trace	Pop	Trace	Pop	Trace	Pop	Trace	Pop
1850	1870	37.2	36.2	10.9	10.0	35.1	34.2	9.4	8.8
1860	1880	35.3	35.2	8.7	10.4	35.0	34.6	9.8	9.3
1870	1890	34.0	34.2	6.9	8.8	36.6	35.0	10.3	9.2
1880	1900	34.9	34.6	7.6	9.3	33.8	34.2	9.9	9.2
Average		35.3	35.0	8.6	9.6	35.1	34.5	9.9	9.1

Using these figures the question of structural changes in prestige may be addressed in two ways. First, fathers' and sons' prestige can be compared within each trace set to determine how these two distributions differ. And we can compare each set to its respective population distribution to see how similar the trace sets are to the distributions from which they are derived.

The mean can be assumed to be a rough single measure of the entire prestige structure of the labor force. If we subtract the sons' mean prestige from the fathers', the result can be seen as a measure of structural change. When we divide this difference by the range of prestige (60 units), the results give us an indication of the dissimilarity of the two distributions.

Additionally, McClendon (1977) makes a good case for using the standard deviation to measure the amount of inequality present within a prestige distribution - the higher the value, the greater the inequality (reflecting the greater distance between scores). By subtracting sons standard deviations from that of their fathers we obtain a measure of change in inequality. Table 6.5 presents the results of these manipulations.

Table 6.5
Structural Prestige Changes
Traced Father-Son pairs

Base Year	Dest Year	Mean Differences	Standard Deviation Differences
1850	1870	2.1 (3.5%)	1.5
1860	1880	.3 (.5%)	-1.1
1870	1890	-2.6 (-4.3%)	-3.4
1880	1900	1.1 (1.8%)	-2.3
Average		.2 (.3%)	-1.3

Figures reflect the traced sons' distribution subtracted from the traced fathers' distribution. Percentage scores are proportionate dissimilarity. See Table 6.4.

In terms of structural change, fathers in 1870 and sons in 1890 show the greatest change, and the only negative change between the two groups. This is due to factors mentioned earlier regarding data base differences and a factory's closing. This pair also has the greatest increase in inequality. Otherwise, the two prestige distributions are remarkably similar, with less than 5% change when based on the range of possible values. Inequality also remains fairly steady, decreasing only in the 1850 - 1870 set, a change that probably resulted from the reduction in the shipbuilding industry.

It should be noted that this 5% change only appears to be small. There is actually no basis for comparison, hence the proportion of change is difficult to interpret (see McClendon, 1977).

This lack of change should be examined with a view to the twelve-year age difference between fathers and sons (Table 6.2), and increasing industrialization with its consequent increase in non-manual occupations (which are usually higher in prestige). It seems that these two things, age and changing occupational structure, can account for the overall similarites.

With sons so much younger, we would expect their prestige to be lower than their fathers'. However, with an expanding non-manual sector, the average prestige of the entire labor force would presumably be greater. When we merge these two ideas, the most plausible explanation for the prestige similarities is that sons took jobs in the lower levels of the expanding service sector, thereby increasing their prestige in relation to their fathers. This simple counterplay between age and expansion could account for the lack of change in the prestige structure.

This idea of the interplay between age and structural change is further illustrated when the prestige of men in the trace sets are compared to their respective populations. Table 6.6 presents the differences between these groups. Refer to Table 6.4 for the raw figures.

Table 6.6
Differences in Prestige
Males
Traces Set Minus Population Set

Base Year	Dest Year	Fathers' Prestige Difference	Sons' Prestige Difference
1850	1870	1.0	1.1
1860	1880	.1	.1
1870	1890	-.2	1.6
1880	1900	.3	-.4
Average		.3	.6

This table indicates that the distribution of fathers' prestige is very similar to the prestige distribution of the population. The greatest difference occurs in 1850, where the fathers whose sons remain to be traced averaged one prestige unit higher then the population mean. In all other years, fathers' prestige and the prestige of the population show only minor differences.

Traced sons, on the other hand, tend to have higher prestige than their respective populations. This is especially true for 1890, for reasons dealt with above. On average, sons' prestige is twice as high above their population means as their fathers'. These results can be considered weak evidence for a shift of the sons into non-manual positions.

Prestige is only one way to measure changes in occupational structure. A different but complementary approach is to look at the occupational categories that are readily available when using the SIOP scale. For this, the occupations are grouped twice. First, to determine specific changes, we examine major group categories (see Treiman, 1977a). Following this, the codes are further grouped into a manual/non-manual dicotomy to look for broader trends.

In this analysis, occupational categories are treated as nominal categories even though some case can be made to treat them as ordinal or interval (see Tully, Jackson, and Curtis, 1975).

The present study has one advantage over most mobility studies in that we have at our disposal the actual male population figures for each point in time (see Chapter One). Using these figures, actual trends in the occupational structure are visible. The procedure we follow yields interesting and informative results.

The labor force was divided into the ten SIOP major code groups, noting the number of active male workers in each category, and the totals. The proportion of the total labor force contained in each category for each year was then found. The source-year proportion (base year of population set) was then subtracted from the destination-year proportion (destination year of population set). Resulting differences are positive when the destination proportion is greater, negative when it is less, and zero when there is no change.

These figures were then compared to the trace sets proportioned in the same way. It should be noted that the source list in each of the trace sets may represent fewer actual occupations than the number reported due to the presence of multiple fathers in these sets. Because of this feature of the data, the proportion change in these sets must be treated with caution.

Table 6.7 presents the SIOP major group code numbers and their corresponding titles for reference purposes. Codes 0 and 1, and codes 7, 8, and 9 are not differentiated in Treiman's (1977a) SIOP scale by major group headings or prestige scores. They are distinguished here to allow a more detailed examination of structural change. Parenthetical titles following these code numbers indicate the major type of worker in these categories.

Table 6.7
Titles of SIOP Major Group Code Numbers

Code	Title
0	Professional, technical, and related workers (high professionals)
1	Professional, technical, and related workers (low professionals)
2	Administrative and managerial workers
3	Clerical and related workers
4	Sales workers
5	Service workers
6	Agricultural workers, fishermen and related
7	Production and related workers (workers in manufacturing)
8	Production and related workers (craft and skilled workers)
9	Production and related workers and laborers (semi- and unskilled workers and transportation operatives)

(See also Appendix I)

Tables 6.8 thru 6.11 present both the actual population proportions and the trace set proportions. Raw data for population figures may be found in Appendix IV. The columns headed 'population' include the percentage distribution in each major group for the entire population for the years indicated. The columns headed 'trace' indicate the fathers'

Table 6.8
Major Group Proportions
1850 to 1870
Males
Population and Trace

Population %				Traces %			
Code	1850	1870	Delta	Code	1850	1870	Delta
0	4.2	1.9	-2.3	0	3.4	3.1	-0.3
1	1.9	2.7	.7	1	1.0	1.7	.7
2	3.6	.5	-3.1	2	5.8	.3	-5.5
3	6.7	3.9	-2.8	3	3.4	6.4	3.0
4	4.2	15.4	11.2	4	7.8	21.0	13.2
5	1.1	2.7	1.6	5	3.1	3.7	.6
6	8.9	7.9	-1.0	6	8.1	4.7	-3.4
7	11.9	9.7	-2.2	7	8.1	5.8	-2.3
8	11.9	10.1	-1.8	8	15.6	8.1	-7.5
9	45.7	45.3	-0.4	9	43.7	45.1	1.4
N	2587	2566		N	295	295	
Difference = 13.6				Difference = 18.9			

Table 6.9
Major Group Proportions
1860 to 1880
Males
Trace and Population

Population %				Traces %			
Code	1860	1880	Delta	Code	1860	1880	Delta
0	2.4	2.4	0	0	1.8	2.3	.5
1	2.8	2.1	-0.7	1	1.8	2.0	.2
2	2.5	.6	-1.9	2	1.3	.5	-.8
3	2.8	5.0	2.2	3	1.3	8.4	7.1
4	12.5	13.3	0.8	4	10.4	17.2	6.8
5	3.4	5.4	2.0	5	2.0	3.5	1.5
6	10.2	11.8	1.6	6	12.7	11.1	-1.6
7	11.0	7.4	-3.6	7	9.1	4.1	-5.0
8	11.5	8.9	-2.6	8	11.6	7.8	-3.8
9	40.8	43.2	2.4	9	48.1	43.0	-5.1
N	2358	2921		N	395	395	
Difference = 8.9				Difference = 16.2			

Table 6.10
Major Group Proportions
1870 to 1890
Males
Trace and Population

Population Code	1870 %	1890 %	Delta	Traces Code	1870 %	1890 %	Delta
0	1.9	1.9	0	0	1.1	3.3	2.2
1	2.7	1.5	-1.2	1	1.1	1.4	.3
2	.5	1.3	.8	2	0	1.9	1.9
3	3.9	10.5	6.6	3	2.2	15.7	13.5
4	15.4	8.2	-7.2	4	11.1	11.7	.6
5	2.7	5.8	3.1	5	3.0	4.1	1.1
6	7.9	7.2	-.7	6	10.3	7.9	-2.4
7	9.7	6.4	-3.3	7	9.2	4.1	-5.1
8	10.1	24.2	14.1	8	12.2	18.7	6.5
9	45.3	33.0	-12.3	9	49.9	31.4	-18.5
N	2566	3405		N	369	369	

Difference = 24.6 (Population); Difference = 26.1 (Traces)

Table 6.11
Major Group Proportions
1880 to 1900
Males
Trace and Population

Population Code	1880 %	1900 %	Delta	Traces Code	1880 %	1900 %	Delta
0	2.4	2.1	-.3	0	.8	2.3	1.5
1	2.1	2.2	.1	1	1.3	2.3	1.0
2	.6	.4	.2	2	.5	.8	.3
3	5.0	5.6	.6	3	4.3	8.7	4.4
4	13.3	11.5	-1.8	4	12.5	16.8	4.3
5	5.4	7.4	2.0	5	4.1	6.6	2.5
6	11.8	7.9	-4.0	6	14.8	8.4	-6.4
7	7.4	5.5	-1.9	7	6.6	4.6	-2.0
8	8.9	18.7	9.8	8	10.2	14.8	4.6
9	43.2	38.5	-4.7	9	44.9	34.7	-10.2
N	2921	3460		N	392	392	

Difference = 12.7 (Population); Difference = 18.6 (Traces)

(first year in pair) and sons' (second year in the pair) percentage distribution. Delta columns are the differences between the destination and base years. The difference score, found at the bottom of each table, indicates the actual difference in proportions between the base and destination years.

These figures show an interesting but anticipated pattern. In all years the bulk of the labor force is concentrated in the manual occupations (codes 5 - 9), with these occupational proportions declining slightly in later years. This pattern results from the increasing (but not yet pervasive) industrialization of the community. The same general pattern is seen in both the population and trace sets.

The next feature of interest is the column headed 'delta.' This is simply the difference between the destination and source years, positive values indicating an increase for the occupational category in terms of proportion of the labor force; negative values a decrease. Again, a consistent pattern is found. In most years the manual categories decrease and the non-manual increase both in the population as a whole and in the trace sets. Some deviation from this pattern is noted. SIOP code 8, which includes shoemakers, increased in both the 1870 - 1890 and the 1880 - 1900 sets. This increase is a result of the development of the shoe industry in Portsmouth during the mid 1880s.

In the 1850 - 1870 set, declines in both SIOP codes 0 and 2 are evident. As was mentioned earlier, administrative and managerial occupations (code 2) decrease because of the decline in shipbuilding. Code 0, which includes professions such as doctors and ship captains, declined for the same reason - fewer ship captains were reported in the city due to the decline of the shipping and shipbuilding industries.

There are some other deviations from the general pattern of a shift from a manual to a non-manual labor force, such as a decline in the proportion of salesworkers and related occupations (code 4) in the 1880 - 1900 set, but these seem to be reflecting the different base sizes of the labor force and can be considered the result of a lag between the growth of the community and the development of the service sector to properly match this growth. An alternative explanation would be that retailing had reached a point where it could begin to take advantage of "economies of scale."

When we compare the population and trace sets they are found to be very similar in terms of proportionate movement. The trace sets show more movement and a greater amount of structural turnover than the population sets, but this is to be expected because of the smaller number of men in the trace sets. Beside these differences, the two groups have very similar patterns.

The final feature of structural change that we examine in these tables is the dissimilarity seen in each set. The delta column, since it is the difference between two proportioned columns, always sums to zero. If we take the absolute value of the difference and divide by two (or take the total of either positive or negative changes and drop the sign), the result can be called the difference score. Since any change in the occupational structure, growth or decline, is matched by a corresponding decline or growth in some other part of that structure in terms of proportions, the difference score notes the gross dissimilarity between the two sets (see Tully, Jackson and Curtis, 1975, for a related example). This gives us a rough measure of how differently the two distributions are proportioned.

The set with the largest difference score is that of 1870 - 1890, where the destinations of both population and trace sets are proportioned about 25% differently from their bases. This is due in large part to the shoe factory opening mentioned earlier and to the differing nature of the data sets (1890 being a directory). The smallest difference score is between the 1860 - 1880 data sets where even though a major war had a large impact on the labor force (see Chapter Two) the structure had time to recover its pattern. The two other sets have similar difference scores, probably reflecting the average proportionate change that the community experienced during this period.

When we further collapse these categories into a manual (codes 5 - 9)/non-manual (codes 0 - 4) split, the broader pattern of a shift toward non-manual occupations is clearly illustrated. Tables 6.12 - 6.15 present the proportions in each category for both population and trace sets. In these tables the columns headed 'population' give the percentage distribution of the labor force as a whole for the base and destination years for each period. The columns headed 'trace' give the same information for the trace sets. The delta columns are the destination minus the base percentage for each row.

Table 6.12
Manual and Non-Manual
Proportions of the Labor Force
1850 - 1870
Males

	Population				Trace		
	Base	Dest			F	S	
Code	1850	1870	Delta	Code	1850	1870	Delta
Non.	20.7	24.4	3.7	Non.	21.4	32.5	11.1
Man.	79.3	75.6	-3.7	Man.	78.6	67.5	-11.1

Table 6.13
Manual and Non-Manual
Proportions of the Labor Force
1860 - 1880
Males

	Population				Trace		
	Base	Dest			F	S	
Code	1860	1880	Delta	Code	1860	1880	Delta
Non.	23.1	23.3	0.2	Non.	16.6	30.4	13.8
Man.	76.9	76.7	-0.2	Man.	83.4	69.6	-13.8

Table 6.14
Manual and Non-Manual
Proportions of the Labor Force
1870 - 1890
Males

	Population				Trace		
	Base	Dest			F	S	
Code	1870	1890	Delta	Code	1870	1890	Delta
Non.	24.4	23.4	1.0	Non.	15.5	34.0	18.5
Man.	75.6	76.6	-1.0	Man.	84.5	66.0	-18.5

Table 6.15
Manual and Non-Manual
Proportions of the Labor Force
1880 - 1900
Males

	Population				Trace		
	Base	Dest			F	S	
Code	1880	1900	Delta	Code	1880	1900	Delta
Non.	23.3	21.9	-1.4	Non.	19.4	30.9	11.5
Man.	76.7	78.1	1.4	Man.	80.6	69.1	-11.5

The most obvious patterns in this series are to be found in the deltas for each pair of sets. In all but one case there is a shift from manual to non-manual occupations and the shift is more pronounced in the trace sets. This finding may indicate that those sons who remained in the community had some advantage in entering non-manual occupations. At this point, this explanation must be regarded as tenuous because of the multiple reporting of some fathers.

If we compare the destination columns in all pairs of tables, however, the idea of some advantage for these stationary sons is supported. In all cases a higher proportion of sons in the trace sets is to be found in non-manual occupations.

Comparisons of the base columns in all pairs of tables are problematic due to multiple reports of fathers but the trend seems to be that the fathers are disproportionately found in manual occupations in the trace sets. The explanation for this might be that, due to their age, they are actually reflecting an occupational distribution that is prior in time to the base year. Indeed, if the base year is lagged twenty years, such that the 1870 base is compared to the 1850 population set, the extent of difference becomes much less.

Because of the increase in the non-manual sector it is likely that some reproductive mobility is occurring (see Kahl, 1975: 56-57). Reproductive mobility occurs when one group reproduces at a rate less than replacement for their occupational group. In terms of proportions, in all cases there are fewer non-manual fathers than non-manual sons. Much of the difference between these two groups can be attributed to the taking of non-manual positions by sons of manual workers that would otherwise have been filled by sons of non-manual workers.

The data, limited as it is to males (Chapter One), does not allow the calculation of the reproductive behavior of men in the various occupational categories. In census years, however, both head of household and their sons are reported. From this information we may generate a father-son ratio that may substitute for a measure of actual reproductive behavior.

In the five census years there are a total of 1,824 fathers reported in the non-manual sector (SIOP codes 0 - 4) with 1,619 sons. The father-son ratio for this group is .89. There were 6,548 fathers reported in the five census years as holding occupations in the manual sector, and these men were reported as having 6,566 sons, for a father-son ratio of

1.00. With these crude rates, the idea of some reproductive mobility occurring within this time period may be supported.

In general, Tables 6.12 to 6.15 are reflecting the real growth of non-manual occupations in the community. If we refer back to Table 6.5, the minor prestige differences exhibited there indicates that the sons are acquiring low-level positions in the non-manual sector. On the basis of these discussions, it is probable that the original explanation of similarity in prestige scores between fathers and sons being a result of increased industrialization is correct.

However, changes in the occupational structure as measured by these nominal categories are greater than we would expect on the basis of the prestige shift discussed earlier. This is a reflection of the heavy weighting of the prestige distribution within the community toward the manual and generally low- prestige occupations.

In sum, the occupational structure changed consistently through the fifty years covered by these four intergenerational trace sets. This will have consequences for the study of mobility of sons who remain in the community, but these will not be serious in terms of situs tracing due to the way situs is operationally defined (see Chapter Five).

Section IV - Conclusion

In the city of Portsmouth during this fifty-year period the occupational structure remained predominantely manual in nature. There was, however, a definite growth in the non-manual sector stemming primarily from increased industrialization. An increase in size of the non-manual sector, and probably less-than-replacement reproduction behavior by non-manual fathers, created vacancies that were taken by sons who remained in the community. This is reflected by the more rapid growth of the non-manual sector in the trace sets than in the population sets.

The traces described in this chapter will be used, with some additions, as the data for situs analysis. Consequently, changes in the occupational structure documented here will decrease the influence of situs on intergenerational mobility. Network contacts occur at the level of the individual and are utilized most effectively at this level (see Chapter Three). With a change in the occupational structure forces outside the control of the individual are at play, creating opportunities that would not exist in a static structure.

The occupational composition of any industrialized community is always in a state of flux. The determination of situs, addressed in the previous chapter, does take account of a portion but not all of the change described above. In the next twc chapters we explore the influence of situs on intergenerational mobility.

CHAPTER SEVEN

THE IMPACT OF SITUS: PRELIMINARY ANALYSIS

This chapter is the first of two that examine intergenerational mobility in the context of situs. This preliminary chapter discusses some of the conventions used throughout our examination and explores general characteristics of the father-son traces in the context of two categories of situs. The concern of this chapter is the degree to which intergenerational mobility can be defined in terms of career connections. It is not the content of occupations that is of concern but, rather, the degree that communication characteristic of occupations gives rise to a generalized interpretation.

When the intergenerational traces are examined at a general level the concept of situs is easily supported. Following this examination, we superimpose the intergenerational trace data on the linkage charts developed in Chapter Five, both to prepare the data for analysis (Chapter Eight) and to explore where situs connections between fathers and sons are to be found. This brief chapter simply introduces the analysis and is followed by a chapter that examines specific hypotheses that directly address the situs concept.

Some specification is in order before we begin our analysis. First of all, since fathers and sons are always reported in some occupation, each particular occupation may be treated as a distinct unit. In this chapter all individual results are combined to arrive at a general overview of the influence of situs on intergenerational mobility. Along with this it should be noted that situs is treated as a structural regularity. Thus, whether a son is in his father's situs is measured not by his father's career line but by the career connections associated with the occupation identified with his father twenty years previously. For example, if we want to find out how many situs-related intergenerational moves occur in each trace set, we determine where each son is reported in the linkage charts in relation to his father's occupation, and then combine the results.

Secondly, occupational connections may be examined in terms of either inflow or outflow. In this chapter we are not concerned with the direction of movement - the totals are the same in both directions. When the focus is on particular occupations, as it is in the next chapter, direction becomes important. With inflow, we are concerned with how many fathers (sources) are in the particular network type of their sons' (destination) occupations. With outflow, we are concerned with how many sons (destinations) are in the particular network type of fathers' (source) occupations. Outflow analysis assesses the generalized effects of father's occupation on his son's occupation, and inflow analysis is appropriate in determining the difficulty of entry into various occupational destinations (Yamaguchi, 1983). Since there is no reason that the two should show the same patterns, similar findings in both types of examination will lend strength to our interpretation.

Finally, we are determining situs placement on the basis of the four linkage sets (Figures 5.2 to 5.5) developed in Chapter Five. Since the intergenerational data that are examined match the periods covered by these charts (Chapter Six), the analysis is actually being replicated four times and each trace set is best seen as a pseudo-replication (Loether and McTavish, 1974). When each set is examined separately, common patterns give us confidence that we are actually looking at a regularity existing within the population. For some analyses, however, the four sets are combined to illustrate the overall pattern.

Section I - Total Traces in Networks

Our first step in looking at situs is to examine the network connections displayed by our trace data. (As a convention, trace sets refer to intergenerational traces, and linkage sets to career connections.) Table 7.1 presents the totals traced to both primary and secondary networks within each of the four data sets.

Table 7.1
Intergenerational Father-Son Traces
By Type of Network Connection

Base Year	Dest. Year	Total Traces	Total Situs Connect.	Total Primary	Total Secondary	Total Not Connected
1850	1870	295	173 (59%)	131 (45%)	42 (14%)	122 (41%)
1860	1880	395	245 (62%)	184 (47%)	61 (15%)	150 (38%)
1870	1890	369	226 (61%)	150 (41%)	76 (20%)	143 (39%)
1880	1900	392	216 (55%)	132 (34%)	84 (21%)	176 (45%)

As can be seen, in each set more than half of all traces are to some network connection. The proportion traced to the primary network declines after 1870, and the proportion traced to secondary networks increases after this date. This shifting is most likely a response to the development of a larger and more diversified industrial base after 1880 (Chapter Two).

These raw figures indicate that network contacts may be an important source of mobility information. As noted previously, the non-manual sector of the labor force was expanding during the period under study. With this expansion, many white collar jobs became available to new entrants into the labor force and these jobs, according to the linkage sets, are not usually within the networks of the predominantly manual fathers. However, even with this structural change the majority of intergenerational traces are found within situs groups.

These raw numbers, of course, need to be examined more fully before we can make any general statements about network connections. To move in this direction our linkage charts are examined to see how well they mirror actual intergenerational movement.

Section II - Mapping Trace Sets to Linkage Charts

In this section we compare the intergenerational trace sets to the linkage charts developed earlier. The original charts are modified to some extent to allow the presentation of these data in a visual format. We are assuming that these charts are a reflection of the most probable intergenerational connections, and as such may serve as maps of where this movement will occur.

Figures 5.2 through 5.5 (Chapter Five) present all pertinent information about occupations connected in terms of careers. The same basic charts are used in this presentation, but all information contained in these charts, except the connections, is deleted. In the place of this information, three numbers appear. The first, in the same location as on the original figures, is the occupational code number for identification purposes. The two other numbers represent, respectively, the total number of fathers reported in that occupation who had sons traced intergenerationally, and, following the colon, the total number of traced sons who were reported in that occupation. The number of fathers and sons found in an occupation serves (in Chapter Eight) as the basis for determining the significance of situs connections.

The discussions in Chapters Three and Four indicated that the two network types (primary and secondary) that comprise the situs of an occupation define three kinds of intergenerational movement. Primary networks include both occupational succession (that is both source and destination of a traced pair in the same occupational category) and direct connections (movement from one occupation to another connected by a single, direct line). Secondary networks involve those occupations that have an indirect connection (movement from one occupation through one other to a third occupation, with only two lines used to trace the path).

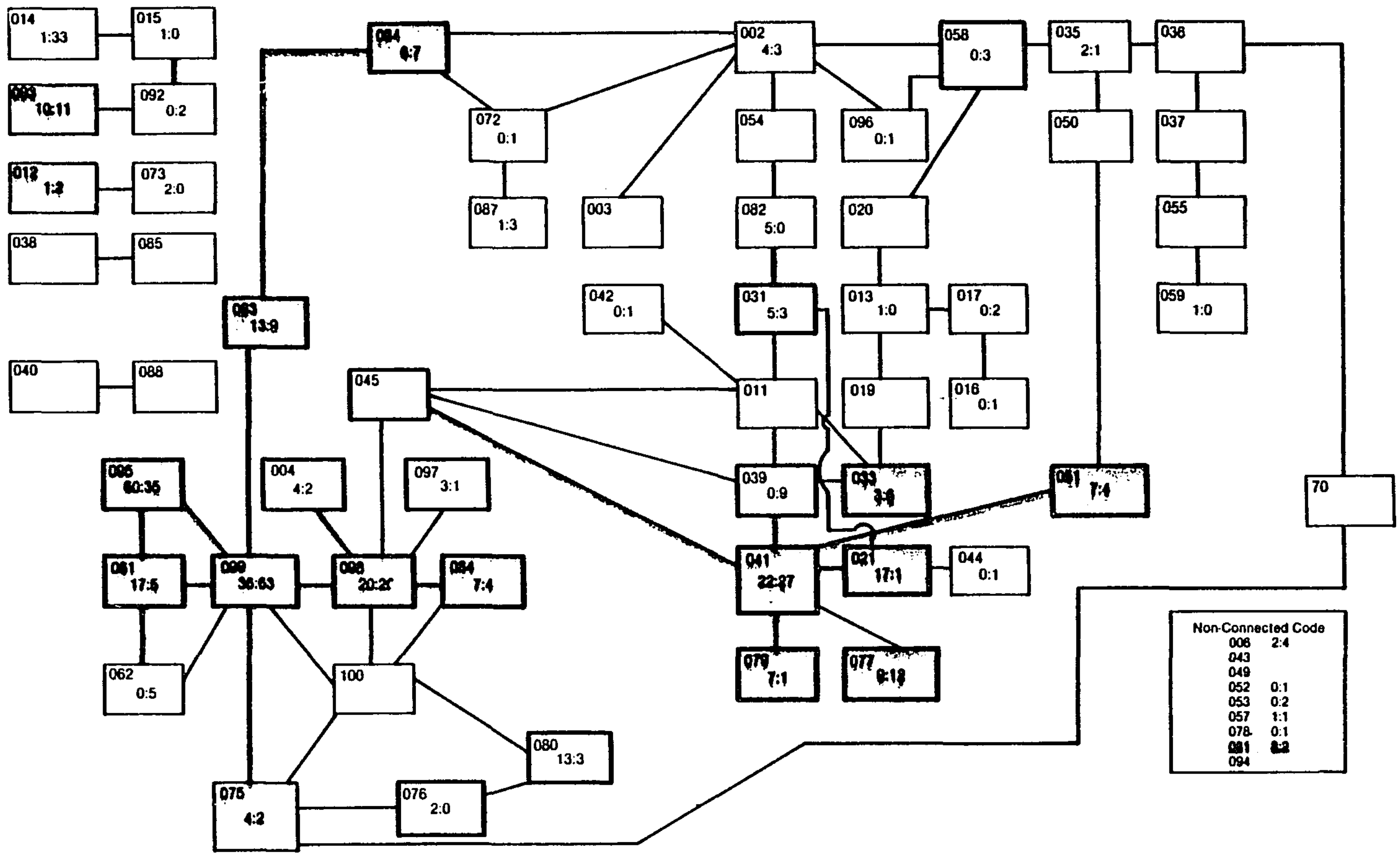
Figures 7.1 to 7.4 (below) offer a visual presentation of the intergenerational data within the context of the career movement patterns of men in the labor force. These charts are presented for two specific purposes. First, situs has been conceptualized as a structural regularity, and the linkage charts (Figures 5.2 to 5.5) indicate the patterns of career mobility delineating this regularity. Superimposed upon this pattern, the actual number of fathers and sons traced within the labor force is now indicated on these charts. Since only 11% of the labor force has been traced intergenerationally, these figures show the different distributions of fathers and sons at the time their occupations were reported. The distribution of these smaller father-son sets can be expected to vary to some degree from the patterns established by the larger sample used to define the situs patterns.

The second purpose of Figures 7.1 to 7.4 is to show where situs connections occurred. To do this, each figure is shaded to indicate the particular pattern of situs connection found associated with each occupation. A dot pattern is used to indicate primary networks. If an occupation box is shaded, this indicates that there was occupational succession between fathers and sons in that occupation. If the line between two occupations is shaded, this indicates that the two occupations were directly connected intergenerationally: at least one father-son pair was reported with one of the pair in each of the two connected occupations. Secondary networks, which are difficult to represent due to the multiple overlapping that inevitably occurs, are indicated by a darker boarder placed around the occupation box. This indicates that at least one father-son pair was reported with the father in an occupation which was indirectly connected to the occupation in which the son was reported.

This scheme is presented to show where intergenerational situs movement occurs within the patterns established by career connections. Since situs is seen as a structural regularity, the shading scheme indicates where this regularity serves to channel intergenerational mobility.

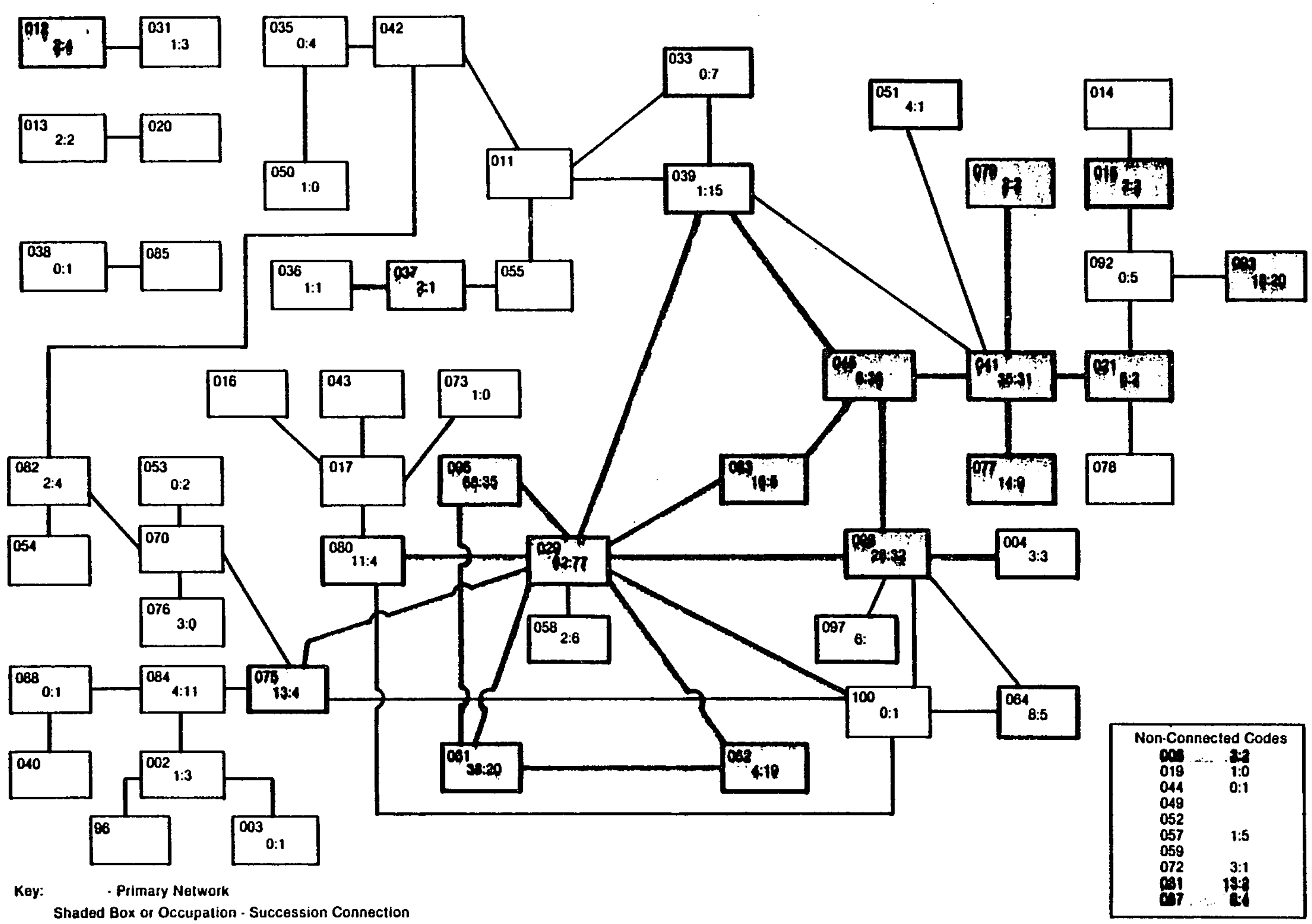
The actual number of men traced between these various occupations is difficult to represent because of both space limitations and the multiple overlapping that occurs. Refer

Figure 6.2
1850 to 1870 Linkage Chart
Father:Son
Intergenerational Traces Superimposed



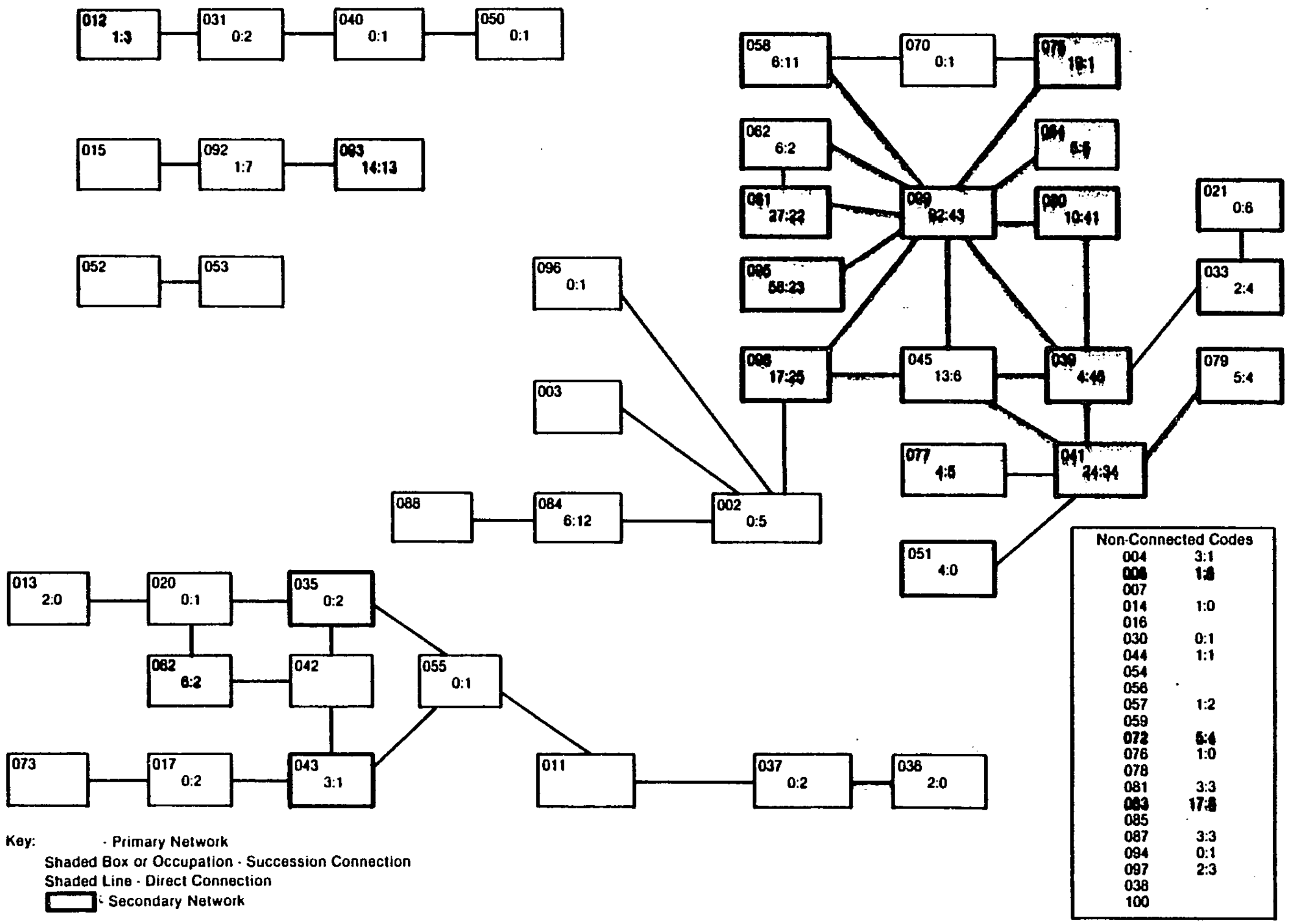
Key: - *Primary Network*
Shaded Box or Occupation - Succession Connection
Shaded Line - Direct Connection
- Secondary Network

Figure 6.3
1860 to 1880 Linkage Chart
Father:Son
Intergenerational Traces Superimposed



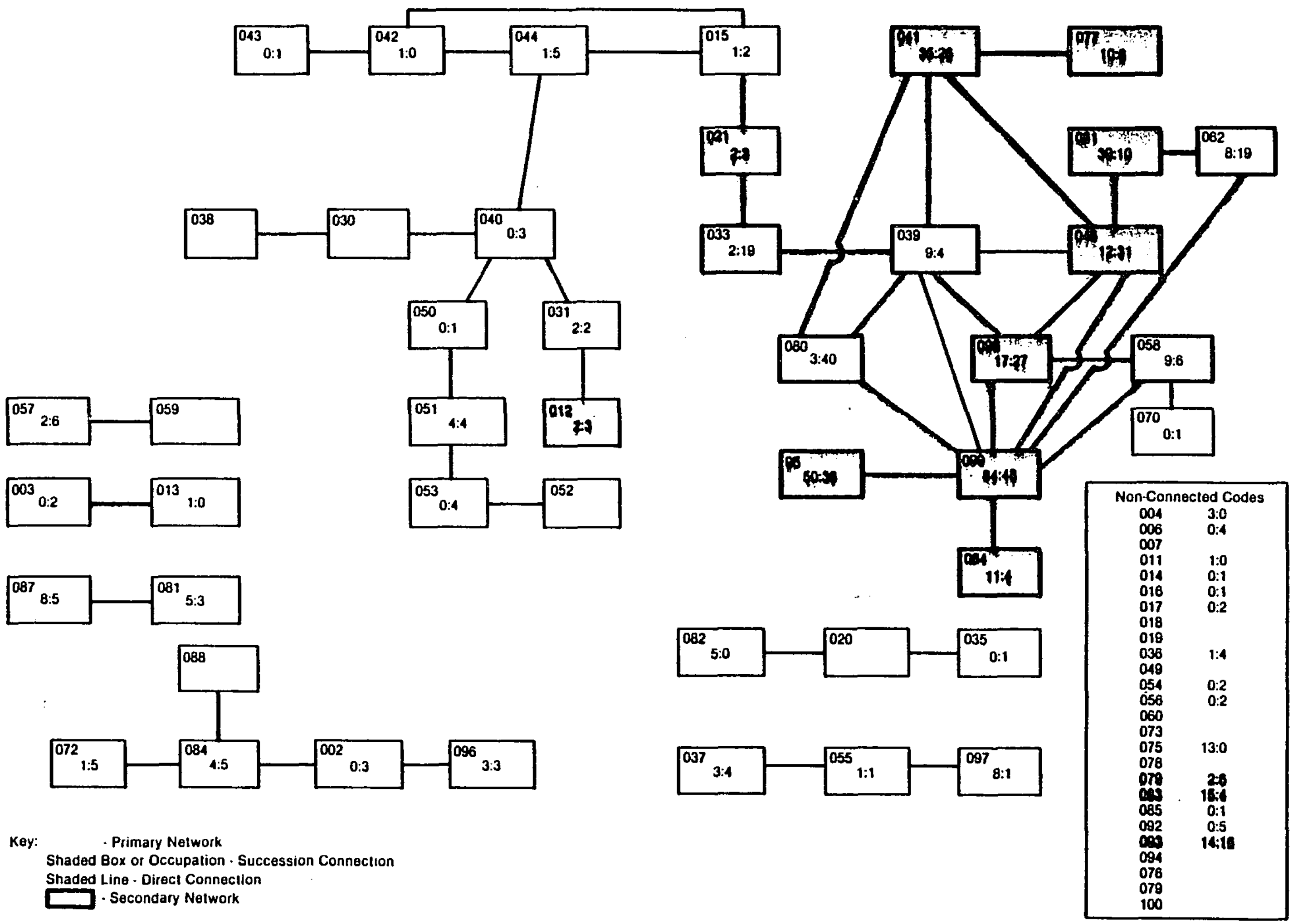
Key: - Primary Network
Shaded Box or Occupation - Succession Connection
Shaded Line - Direct Connection
- Secondary Network

Figure 6.4
1870 to 1890 Linkage Chart
Father:Son
Intergenerational Traces Superimposed



170

Figure 6.5
1880 to 1900 Linkage Chart
Father:Son
Intergenerational Traces Superimposed



to Appendix IX for a listing of the most important movement within each of these situs groups.

In examining the patterns indicating situs connections, two distinct clusters appear in each figure, and they seem to merge together over time. One, which we refer to as the manual cluster, appears centered around code 099, laborers n.e.c. The centrality of this occupation can be seen in all figures, especially Figure 7.3. The other cluster, which we call the enterpreneurial, is centered on code 041, working proprietors retail. This can be seen most clearly in Figures 7.1 and 7.2.

These two clusters are close together (in terms of career and intergenerational traces) in all of the figures. However, they visually become even closer as we follow the charts through time, until in Figure 7.4 the two merge with an actual primary network career linkage and intergenerational connection occurring for the first time between an occupation from the manual cluster and the center of the enterpreneurial cluster (occupation code 080 is directly connected to code 041). There is no way to measure the actual "distance" between the two clusters, but the visual displays offered here suggest that they do become closer.

Additionally, these two clusters in all figures include the majority of traces that occur. For example, 77% of the reported fathers in the 1860 to 1880 trace set are within the situs of laborers n.e.c., and 74% of the reported sons are also within this situs. In the 1880 to 1900 set, where the two clusters merge, 71% of the reported fathers are in the manual cluster, and 53% of the reported fathers are in the enterpreneurial cluster. The total of these two percentages, 124%, demonstrates the multiple overlapping that has developed through time. This leads to an interesting conclusion - situs connections operate primarily in restricted areas of the labor force of the community. The two clusters are different in some respects, but they do have some similarities. For both clusters, credentials as such (i.e., specific educational requirements beyond basic literacy or training) are not important. In the manual cluster, a person needs only a certain understanding of basic instructions to find employment. In the enterpreneurial cluster, basic literacy is important, as well as a certain amount of capital to stock and maintain a store.

The actual size of the establishment for a proprietor was not a criterion for inclusion under this heading (see Chapter One), hence all a man needed was to have available a minimum amount of cash and he could open his own shop. Conversely, if the son of a proprietor could not find employment in his father's occupational group, common laboring positions were always available. If some proprietors were indeed very small businessmen, they and their children would never be far from the laboring positions.

This lack of credentials fits with our discussion of networks. Even if a man knew of an opening, his son would have to possess any credentials required before he could take the position. Since credentials were required for some occupations during the period under study, we would expect in general to find few traces mapped by networks to these positions.

Broadly speaking, this is the case. Doctors (code 006) never appear linked to other occupations in careers. Of those occupations that are linked, engineers and architects (code 002) and lawyers (code 012) may serve to illustrate this point. Engineers and architects are connected by career movement to other occupations in all figures, with representation from both generations. However, in no figure are sons of engineers or architects found in occupations within the networks of their fathers. Sons of lawyers, on the other hand, do become lawyers, but this is the only form of connection in any figure.

In his examination of situs Paul Hatt (1950) observed that higher prestige groups have more resources than most others and may translate these resources, for their sons, into equally high prestige positions. These positions, however, need have no occupational connection to the father's occupation. This point, and others related to it, are discussed more fully in the concluding chapter.

What these findings indicate for our analysis is that since network connections only operate in particular segments of the labor market, the actual number of network connections will be less when we examine the entire structure than it would be if we were to restrict our focus to a selected group of occupations. We continue to look at the entire structure, however, limiting it only to reduce random noise that would otherwise occur. This limiting is discussed in the next chapter.

There are some other features of these occupational connections reflecting both career and intergenerational mobility that are worth noting. The careers of farmers (code 061) change from a direct connection with the manual cluster (see Figure 7.1) to a direct connection to the enterpreneurial cluster (see Figure 7.4). The primary reason for this shift may be that as the number of farmers declined, the average area farmed increased, so that by the time of the last figure, farmers could use their holding to move directly into non-manual positions for themselves. The intergenerational traces also indicate that this shift provided a similar advantage for their sons.

Transportation operators (code 098) were the only low prestige occupation with direct career access to a much higher prestige position. Within this category are included sailors, so a career and intergenerational connection to ship's officers (code 004) can be easily explained. This connection falls apart after 1870 due to the decline of the shipping industry.

In conclusion, our linkage charts give us a rough indication of where intergenerational mobility occurs. Some problems are evident outside of the manual and enterpreneurial clusters, but the proportions traced in these occupations are small and consequently many random factors could account for the lack of situs connection.

In this and subsequent discussions it will be noted that sons who are not within their father's situs are not addressed. Although some interesting connections are found here (the son of a laborer in 1850 is reported as a doctor in 1870), there is generally no pattern to this movement. Since this project is aimed at examining situs, the omission of any examination of non-situs moves is not seen as a major problem.

With the completion of this preliminary examination of our data, the next chapter focuses on specific theoretical hypotheses.

CHAPTER EIGHT

THE IMPACT OF SITUS

In this chapter we determine if the intergenerational movement of sons follows the career patterns of their fathers' occupations as specified by our theoretical discussion of situs. Due to the nature of the data it is impossible to determine whether actual network contacts are the cause of particular mobility patterns. Rather, we have specified what regularities should be found if network connections are influencing intergenerational movement. If these regularities are evident in this analysis, then we may infer that network contacts are the basis of the influence of situs on social mobility.

This chapter is divided into four sections. In the first the procedures used in analyzing our data, and some restrictions placed on the data in order to arrive at interpretable results are discussed. In the second section we examine the influence of situs on the intergenerational movement of sons, both from the perspective of network type and the social distance travelled by the sons. In the third section some characteristics of situs groups, such as age and prestige, are examined. The final section explores the intergenerational traces in the context of a prestige-based mobility analysis, and then examines the patterns of movement within this context that may be related to situs.

Section I - Methodology

The basic data with which we are concerned are the four intergenerational mobility sets described in Chapter Six. These data sets, containing paired father-son occupational information, are referred to as trace sets to distinguish them from linkage sets, or data about individual career movement within the same time frame as the mobility data. This distinction is an important one because the linkage sets indicate the structural regularity imposed by situs within which intergenerational mobility is examined.

In this chapter the trace sets are used in two distinct ways to test various hypotheses. First of all, the sets may be treated in such a way that various statistics are derived from characteristics of men aggregated across all occupational groups (for example, the average age of men in various situs categories). Secondly, each trace set may be examined occupation by occupation. In this approach the various statistics are based on men found in each occupation, the results being characteristics of the occupational groups (for example, the average age of plumbers). These two approaches are necessary because of the various questions addressed.

In discussing situs we have explored two types of information-sharing networks - primary and secondary. The primary network includes the occupation examined, and all other occupations directly connected to it by career movement (indicated by a single line on the linkage charts in Chapter Five). The secondary network includes those occupations indirectly connected to the examined occupation by career moves (that is, two successive lines on the linkage charts). To examine these movement patterns more fully, the primary networks can be decomposed to reveal two distinct types of network connections.

In addressing network connections we distinguish the two components of the primary network in order to see if one or the other is disproportionately responsible for the results found in the combined pair. The possible network connections that may occur are:

a) Succession - where the son has exactly the same occupational title as the father.

b) Direct - where the son is found in an occupation that is directly connected by career movement to the father's occupation.

We will examine both these connections, and primary as against secondary networks, in the remainder of this chapter. (For a visual representation of these various connections, see Figure 8.1.)

In much of our analysis we are exploring movement among occupations and are predicting that intergenerational (trace) movement will mirror career (linkage) movement. With this approach the best method of analysis is to use a difference of proportions test (see Herzon and Hooper, 1976; Blalock, 1979). Before examining this technique we must first discuss how the various proportions are determined and note some restrictions that have been placed on the data. For convenience the discussion is framed in terms of outflow analysis. The same procedures apply to inflow analysis, but source and destination must be reversed.

For this analysis we are concerned with figuring four pairs of proportions. One proportion in each pair is that which would be expected under conditions of random movement, and the other is the observed proportion. The four pairs with which we are concerned involve primary networks, secondary networks, occupational succession, and direct connections. Since these proportions are central in our analysis, an extended discussion is in order.

Figures 7.1 to 7.4 (previous chapter) provide the basic data for the determination of proportions. On these figures, the first number in each occupational box indicates how many fathers were reported in that occupation in the base year of each intergenerational trace set. The second number indicates how many sons were reported in that occupation in the destination year of each trace set. Of these two numbers, that of the father can be seen as the source, or the number who are available to be traced to other occupations. All observed proportions use such a number as their denominator for each occupation in outflow analysis.

The number of sons may be seen as the number of possible destinations available in each occupation. If five sons are found in an occupation, the maximum number of fathers whose sons may be traced to that occupation is five. The number of sons in occupations with career links to any examined occupation serve as the numerator for determining expected

Table 8.1
Determination of Proportions (Outflow)

Succession Connections	Observed =	tF/ FS
	Expected =	FD/ TT
Direct Connections	Observed =	tD/ (FS - tF)
	Expected =	DT/ (TT - FD)
Primary Networks	Observed =	(tF + tD)/ FS
	Expected =	(FD + DT)/ TT
Secondary Networks	Observed =	tS/ (FS - (tF + tD)
	Expected =	ST/ (TT - (FD + DT)

Where
- TT = Total number in the data set.
- FS = Total number of fathers (sources) in the occupation of interest (the one examined).
- FD = Total number of sons (destinations) in the occupation of interest.
- tF = Total number of sons traced to their fathers' exact occupational title.
- DT = Total number of sons (destinations) in occupations with direct career connections to the occupation of interest.
- tD = Total number of sons traced to any occupation with direct career connections to the occupation of interest.
- ST = Total number of sons (destinations) in occupations with indirect career connections to the occupation of interest.
- tS = Total number of sons traced to occupations with indirect career connections to the occupation of interest.

proportions in outflow analysis.

Table 8.1 presents the various formulas used to determine the proportions for our analysis, and a description of each variable.

The best way to show how these proportions are determined is by using an example from our data.

Figure 8.1 shows a portion of Figure 7.1 for the intergenerational trace set of 1850 to 1870. Numbers in parentheses in each box indicate the occupational code number. Other numbers found are the number of fathers in that occupation (first number), and the number of sons (number following colon). Lines connecting occupations indicate an effective career connection.

In this figure, the occupation of interest is code 083, blacksmiths, toolmakers, and related workers. Occupations 084, machine fitters, and 099, laborers not elsewhere classified, are the two occupations with direct career connections to blacksmiths. When coupled with code 083, these three occupations make up the primary network of blacksmiths. All other occupations in the chart comprise the secondary network of this occupation of interest.

Figure 8.1
Example from Figure 7.1, 1850 to 1870

```
                               ==========               ---------
                               ! (084)  !_______________! (002) !
                               !  6:7   !               !  4:3  !
                               ==========               ---------
                        /          !
                      /            !
                    /              !
         ----------             **********
         ! (072)  !             *  (083) *
         !  0:1   !             *  13:9  *
         ----------             **********
                                   !
         ----------                !
         ! (C95)  !                !
         ! 60:35  !                !
         ---------->               !
---------          >_____ ===========               ----------
! (061) !_________________! (099)   !_______________! (098)  !
! 17:5  !                 ! 63:36   !               ! 20:20  !
---------                 ===========               ----------
                      /        !        >
                    /          !          >
                  /            !            >
                /              !              >
   ----------            -----------           ------------
   !  (062) !            ! (075)   !           !   (100)  !
   !   0:5  !            !  4:2    !           !   0:0    !
   ----------            -----------           ------------
```

Occupation 083, starred, is the occupation of interest. Those with double bases are occupations with direct career connections to the occupation of interest. Others are in the secondary network of occupation 083. Lines between occupations indicate effective career connections.

Table 8.2 is largely based on the numbers appearing in Figure 8.1. The number of sons who are mobile is difficult to represent in these figures, so their values are presented elsewhere (Appendix IX).

Table 8.2
Value of Proportion Variables

Variable	Value	Description
TT	295	Total number in the data set.
FS	13	Fathers in occupation 083.
FD	9	Sons in occupation 083.
tF	4	Number of sons in occupation 083 whose fathers also were in that occupation.
DT	43	Total sons in occupations 084 and 099.
tD	2	Number of sons traced to occupations 084 or 099 whose fathers were in occupation 083.
ST	71	Total sons in occupations 002, 061, 062, 072, 075, 095, and 098.
tS	4	Number of sons traced to occupations 002, 061, 062, 072, 075, 095, or 098 whose fathers were in occupation 083.

Each proportion is then determined as explained in Table 8.1. These formulas are reproduced and worked through for the above values in Table 8.3.

Table 8.3
Example of Determining Proportions

Type of Connection	Type of Proportion	Formula	Values	Proportion
Succession Connections	Observed	= tF/FS	= 4/13	= .31
	Expected	= FD/TT	= 9/295	= .03
Direct Connections	Observed	= tD/(FS-tF)	= 2/(13-4)	= .22
	Expected	= DT/(TT-FD)	= 43/(295-9)	= .15
Primary Networks	Observed	= (tF+tD)/FS	= (2+4)/13	= .46
	Expected	= (FD+DT)/TT	= (43+9)/295	= .18
Secondary Networks	Observed	= tS/(FS-(tF+tD)	= 4/13-(4+2)	= .57
	Expected	= ST/(TT-(FD+DT)	=71/295-(9+43)	= .29

It will be noted that the size of the denominator is decreased in two cases. For secondary networks (occupations indirectly connected by career links to the examined occupation) we decrease the denominator for both observed and expected proportions by the numbers of sons who were traced to the primary network(s) in question (the occupation of interest and all occupations directly connected to it by career links). For direct connections (occupations directly linked by careers to the occupation of interest) we decrease the denominator for observed and expected by the numbers of sons who entered their fathers' occupation(s). These subtractions are based on the reasoning that once a man has been traced to a particular occupation, he is no longer at risk of being found in any other occupation. The denominator for each pair of proportions is thereby reduced in both cases. By reducing the denominator for the calculation of both observed and expected proportions, the proportions are increased in both cases, and thereby we arrive at comparable results.

Prior to considerations of the test for difference of proportions, the restrictions placed on our data should be mentioned. Even a cursory inspection of Figures 7.1 to 7.4 (previous chapter) shows that the numbers reported in each occupation vary enormously. For example, there are between one and 92 fathers per occupation in Figure 7.3. Due to this variation, if there are fewer than five men reported in an occupation, or if the denominator of any proportion contains less than five men, that proportion is not allowed in the analysis. Imposing this arbitrary minimum reduces the random noise that would otherwise be associated with this scattering of values. A brief discussion will illustrate the rationale behind this decision.

If there were 50 fathers in a particular occupation, and 150 sons in the various destinations of that occupation's primary network, the proportions obtained would intuitively make sense. If there were no situs connections, we would be reasonably sure that this lack reflects reality. If, on the other hand, there was only one father in the examined occupation, with 150 sons in the primary network, a lack of connection could be explained by any number of external or random factors. The same reasoning can be seen to apply to the number of sons in the destination occupation. Therefore, all analysis excludes those cases where less than five men are found in either the source or the destination used to determine the proportions. These restrictions only apply in the determination of proportions on an occupation-by-occupation basis.

With these restrictions and procedures in hand, the particular technique used for our analysis may be discussed. Our theoretical perspective indicates that there will be a greater than random chance that our career-based linkage charts will indicate where intergenerational movement will occur. This expectation will be supported if there is a positive difference between the observed and expected proportions of in-situs intergenerational moves, and not supported if there is no difference, or the difference is negative. The general null hypothesis is, then, that there will either be a negative difference, or no difference between the observed and expected proportions.

To determine whether or not to reject the null hypothesis, the derived proportions are examined using the test for difference between proportions found in Mueller, Schuessler, and Costner (1977: 428). Since our general hypothesis states that there will be a positive difference between proportions, a single estimate of the population proportion may be used to estimate the standard error of the difference. Therefore, the first step is to find the weighted mean of the two proportions (Pw).

$$Pw = \frac{N1P1 + N2P2}{N1 + N2}$$

Where N1 = Number in the occupation of interest
N2 = Total number of possible destinations
P1 = Proportion actually traced to the possible destinations (of N1)
P2 = Proportion expected to be traced to these destinations (of N2)

Once Pw has been computed, the standard error of the difference between proportions (Sp1-p2) can be found.

$$Sp1-p2 = ((Pw*Qw)*((N1+N2)/(N1*N2)))^{1/2}$$

Where Qw = 1 - Pw

With this estimate, a standard (z) score for the difference between the proportions may be determined.

$$Z = \frac{P1 - P2}{Sp1-p2}$$

The standard score for each occupation examined in this way can then be compared to the normal curve table to estimate the probability of occurrence of that value or one more deviant. Since this is an exploratory study, we consider all z scores with a probability of 5% or less to be significant values. Thus, since we predict that the difference will be positive, any standard value greater than 1.65 will fall into the critical region where we may reject the null hypothesis.

Using this method of analysis, our first hypothesis about the influence of situs on intergenerational mobility may be explored.

Section II - The Basic Hypotheses

Our theoretical chapters have specified two network types - primary and secondary - that make up the situs of an occupation. In the previous section we have argued that the primary network can be decomposed into intergenerational moves to the same occupation as the father (succession), and moves to occupations directly connected to the fathers' by career links (direct connection). Using these four categories (primary, secondary, succession, and direct) we may examine two specific hypotheses derived from our theory of situs.

The first hypothesis refers to primary and secondary networks. Since we are predicting that the connections found in career traces (linkages) serve as paths of least resistance for intergenerational (trace) mobility, our first hypothesis may be formulated that;

> There will be a greater than random number of intergenerational moves among situs-connected occupations.

The second hypothesis concerns the social distance traveled by the son between his and his father's occupation. This social distance is measured by the specific connection type, with occupational succession (succession connections) being closest, direct connections (movement to an occupation with direct career connections to the father's occupation) being second, and movement to the secondary networks being the greatest social distance traveled. The closer the father is to the information about job vacancies, the more information is available, and the more likely it is to be utilized by the son. From this consideration, we may generate a second hypothesis which may also serve as a refinement of the first;

> The closer the career connection, the stronger will be the intergenerational movement to those occupations so connected.

From this hypothesis we expect occupational succession to show the greatest proportionate movement, direct connections second, and indirect connections the least. In testing this hypothesis we will also examine the components of the primary network (succession and direct connections) to see if our first hypothesis continues to be supported when the connections that comprise the primary network are decomposed.

In this analysis we are concerned with both inflow and outflow. In outflow the occupation on which we focus is that of the father (source), and we examine all sons (destinations) in relation to this source. In inflow the focus is the son's occupation (destination) and we examine all fathers (sources) in relation to this destination. The subtle difference between these two is basically one of perspective (see Miller, 1960, for a related discussion). Outflow analysis, looking at the destinations of sons in relation to their fathers, gives an indication of the constraints on mobility that exist within an occupational structure. Inflow analysis, looking at the origins of sons, gives an indication of the concentration of sons in particular occupations, or how much a certain group of sons monopolizes a given occupational category. If 80% of the sons of farmers are found within their fathers' situs (outflow), a picture of movement emerges that would support our arguments. On the other hand, if only 10% of farmers came from occupations with situs connections (inflow), a different picture emerges. Through the examination of both perspectives, complementary results will lend strength to our argument.

To test our first hypothesis we independently examine each occupation in the intergenerational data sets that meets our restrictive criteria. For outflow analysis there are 56 occupations which have primary networks, and 52 which have secondary networks. For inflow, there are 54 occupations with primary and 50 with secondary networks. With a total of 212 cases, tables of results are difficult to present and interpret. Consequently, the resulting standard scores are presented in the form of histograms.

For each occupation in the data that meets our restrictive criteria a standard (z) score has been computed based on the difference of proportions test. Figures 8.2 and 8.3 present the standard scores resulting from this test for outflow, and Figures 8.4 and 8.5 for inflow. (Raw data for these figures may be found in Appendix IX.1 to IX.8.) Each histogram represents the combination of all four intergenerational data sets. Every set was examined independently to determine if any one biased the results in any particular direction. In all sets, and in all categories, a similar distribution of scores was found.

Based on the results presented in these histograms, Tables 8.4 and 8.5 present summary statistics for both outflow and inflow.

Figure 8.2
Histogram of Outflow Standard Scores
Primary Networks

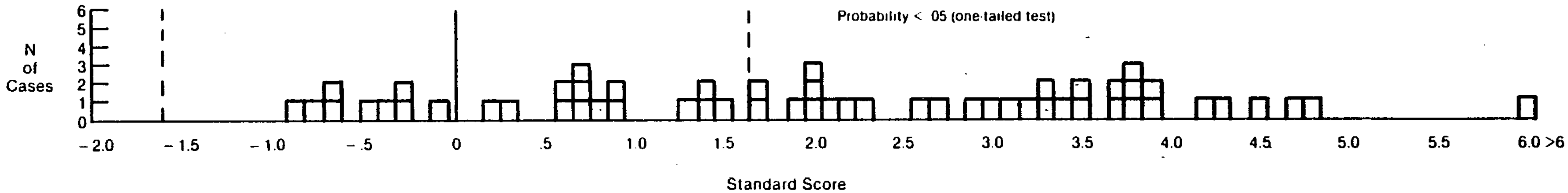


Figure 8.3
Histogram of Outflow Standard Scores
Secondary Networks

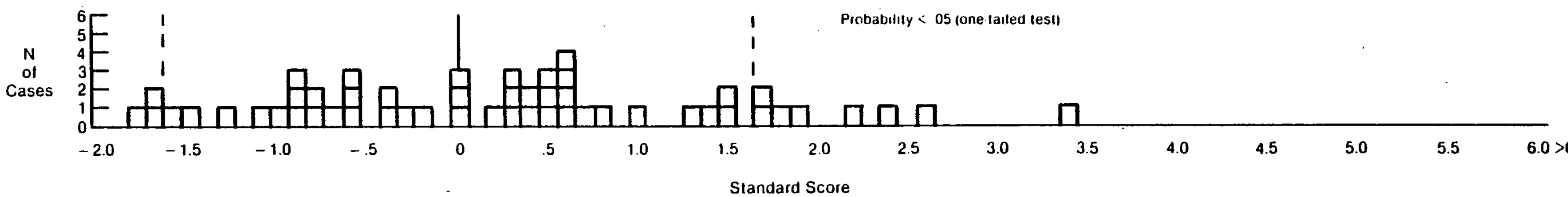


Figure 8.4
Histogram of Inflow Standard Scores
Primary Networks

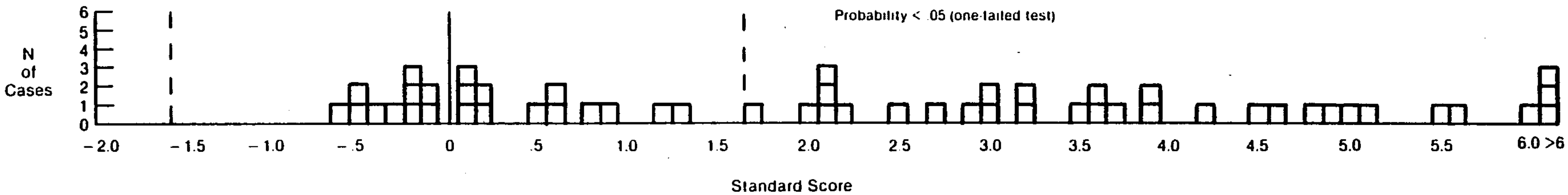


Figure 8.5
Histogram of Inflow Standard Scores
Secondary Networks

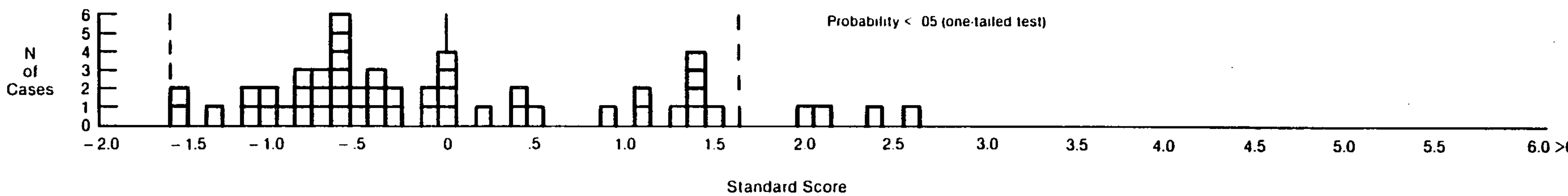


Table 8.4
Outflow Summary Statistics
Primary and Secondary Networks
Standard Scores

Network Type	Number	Mean	St. Dev.	Median	Proportion Significant
Primary	56	2.05	1.73	2.0	.59 (pos)
Secondary	52	.23	1.22	.3	.15 (pos)
					.06 (neg)

Table 8.5
Inflow Summary Statistics
Primary and Secondary Networks
Standard Scores

Network Type	Number	Mean	St. Dev.	Median	Proportion Significant
Primary	54	2.44	2.33	2.1	.59 (pos)
Secondary	50	.03	1.06	-.3	.08 (pos)

The mean standard scores for primary networks in both inflow and outflow are well above the limit we have set for accepting the null hypothesis. A standard score of 1.65 or less would indicate that these results had a greater than 5% chance of occurring randomly. The observed mean standard scores of 2.05 for outflow and 2.44 for inflow both fall into the critical region of a normal curve: The results would be improbable if there were actually no connection between the occupations.

If we look at our histograms for primary networks, we find that for both inflow and outflow, 59% of all of the standard score values fall beyond the 5% cutoff point in a normal distribution. Although the data used for this analysis are composed of four overlapping data sets (Chapter Six), it is assumed that together they form an independent sample (see

Chapter Nine). With these two findings, we may reject the null hypothesis that there is no positive difference between proportions.

When we examine secondary networks, however, we must accept the randomness hypothesis. In both cases the mean standard score is very close to zero, a fact indicating that these networks are basically no different than random connections.

In both inflow and outflow within secondary networks the proportion of standard scores reaching the critical region is small and, in the case of outflow, there are three (6%) occupations whose standard scores fall into the negative critical region. These findings indicate that our conceptualization of situs cannot be effectively extended to secondary networks. Although this may be due to problems in the data, there may be several reasons for this lack of connection that have to do with the specific historical period examined, such as the lack of rapid communication facilities. These possible explanations are discussed in the concluding chapter.

These findings indicate that we must reformulate our hypothesis about situs connections. This reformulation is that:

> There will be a greater than random number of intergenerational moves between occupations connected by primary situs networks.

This hypothesis, of course, is supported by our findings.

Having only been able to support one half of our first hypothesis, what of our second hypothesis? Here we are hypothesizing that the closer the occupational connection the greater will be the situs movement. In this case the decomposed primary network is also examined to determine if one or the other of the connections (succession or direct connections) within this network type contributes disproporticrately to the findings for the entire primary network.

Again, due to the large number of occupations examined, we present the derived standard scores in a series of histograms. Occupational succession and direct connections for outflow (Figures 8.6 and 8.7) and inflow (Figures 8.8 and 8.9) are presented below. Secondary networks are not presented again; they may be found in Figures 8.3 and 8.5. (Raw data may be found in Appendix IX.1 to IX.8.)

The following tables present summary statistics for both inflow and outflow, based on Figures 8.6 to 8.9.

Table 8.6
Outflow Summary Statistics
Succession and Direct Connections
Standard Scores

Contact Type	Number	Mean	St. Dev.	Median	Proportion Significant
Succession	42	3.51	2.31	3.9	.76
Direct	52	.66	1.26	.3	.29
Secondary	52	.23	1.22	.3	.15 (pos) .06 (Neg)

Figure 8.6
Histogram of Outflow Standard Scores
Succession Connections

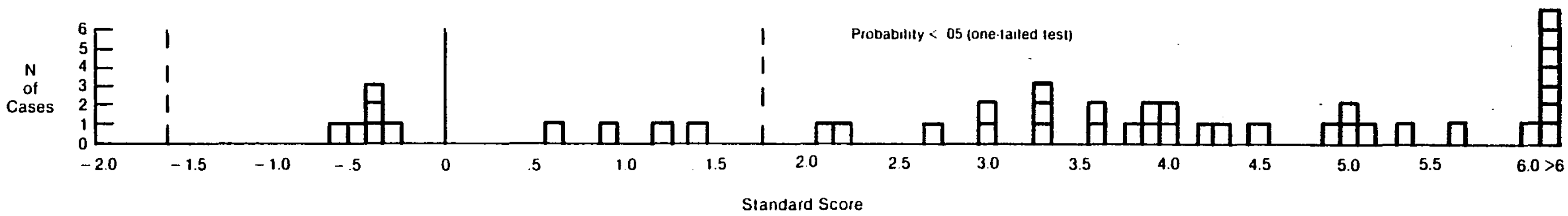


Figure 8.7
Histogram of Outflow Standard Scores
Direct Connections

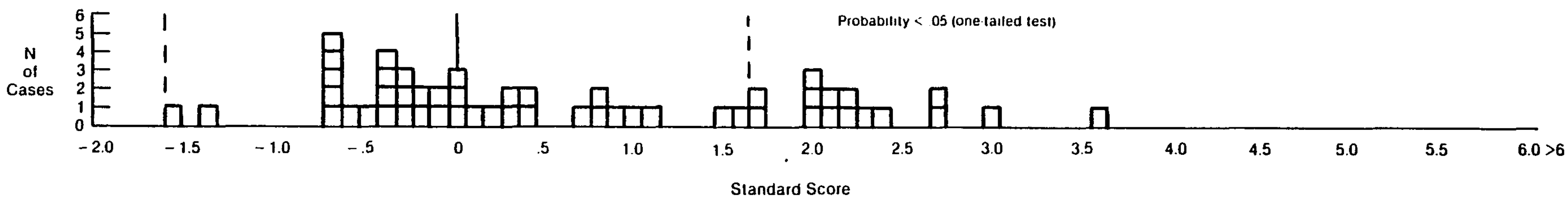


Figure 8.8
Histogram of Inflow Standard Scores
Succession Connections

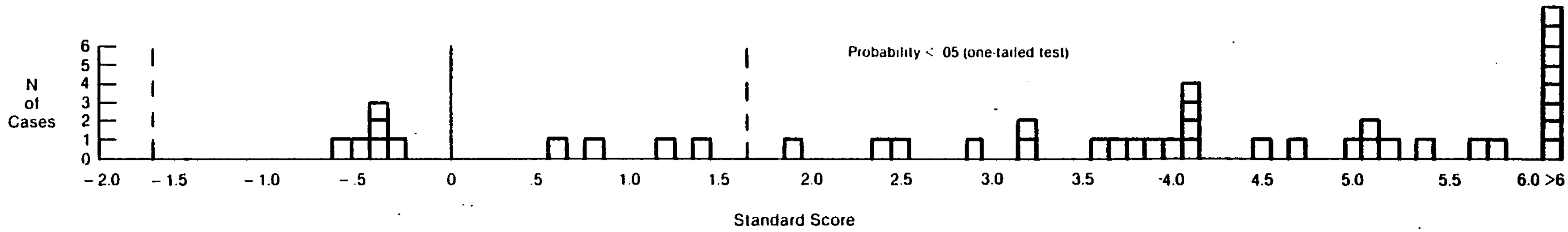


Figure 8.9
Histogram of Inflow Standard Scores
Direct Connections

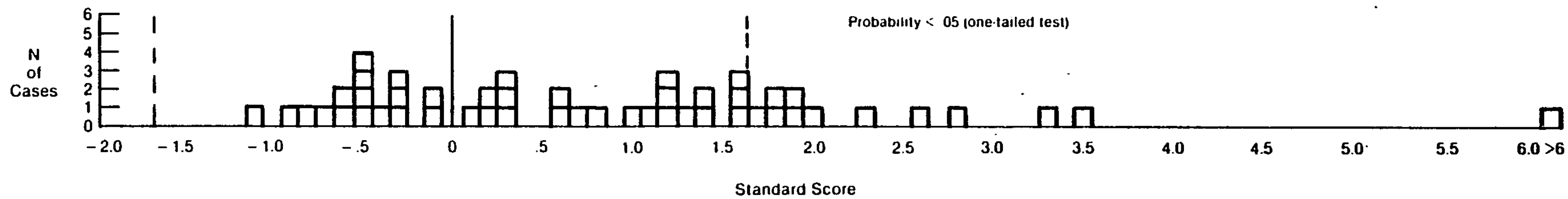


Table 8.7
Inflow Summary Statistics
Succession and Direct Connections
Standard Scores

Contact Type	Number	Mean	St. Dev.	Median	Proportion Significant
Succession	42	3.68	2.47	3.9	.76
Direct	49	.91	1.57	.7	.25
Secondary	50	.03	1.06	-.3	.08(pos)

In these two tables the average standard score is highest for occupational succession, next highest for direct connections, and weakest for secondary networks. The median value and the proportion of standard scores that fall into the critical region also mirror this pattern. With these findings, our hypothesis that the social distance determined by career connections has some influence on the intergenerational movement of sons is supported. The career connections within the fathers' occupation influence the occupational mobility of the sons.

These tables also show that many sons take the same occupation as their fathers, a fact accounting for much of the strength found in primary networks. The mean standard scores for moves between occupations with direct career connections are both below our cut-off point of 1.65 standard units. However, when we examine other aspects of these findings, it can be seen that although these connections are much weaker than those found with occupational succession, direct connections are most likely reflecting an existing, non-random regularity.

If we look at the proportions of standard scores for direct connections that fall into the critical region, in both instances a quarter or more of these occupations are in this range, and there are no significant negative standard scores. This gives us an indication that this type of connection occurs more frequently than would be expected under conditions of random movement.

Another indication of this greater than random contact is found when we construct a confidence interval around the mean standard score for direct connections. The standard procedure used to determine the interval may be found in Herzon and Hooper (1976: 177-183).

The mean difference between observed and expected proportions for fathers' occupations is .66 plus or minus .34 (1.96 times .175 that is, the standard deviation divided by the square root of the number of cases); for sons' occupations it is .91 plus or minus .44 (1.96 times .224). Therefore, the 95% confidence interval for fathers' occupations (outflow) extends from .32 to 1.00, and for sons' occupations (inflow) from .47 to 1.35. These confidence intervals suggest that the corresponding population parameters are probably greater than zero. From these findings we may conclude that, although direct connections are nowhere near so strong as succession in determining where a son will be in the labor force, they are still greater than would be expected under conditions of random movement.

We have found that our basic hypotheses are generally supported. Our first hypothesis about the influence of situs could only be supported for primary, but not for secondary networks. The social distance travelled by the son to the various types of occupational networks followed the expected pattern by having the heaviest movement occur where sons succeed to their fathers' occupation, second heaviest where sons move to an occupation directly connected to their fathers' occupation, and lightest movement to occupations within the secondary networks of their fathers. We also saw that occupational succession has the strongest influence within primary networks, and that direct connections have less, but still significant, influence on the movement of sons within situs groups.

Section III - Secondary Hypotheses

In this section several secondary hypotheses that address the mechanisms of situs are examined. Since these are not interrelated, each may be presented and examined in turn. All hypotheses developed here are formulated on the basis of the modified definition of situs extending only to primary networks.

The first hypothesis involves age. We have postulated that those sons who are in their fathers' situs are, on average, younger then sons who are not in their fathers' situs. Our reasoning is that the information available to the father will encompass almost all of the information available to the son about the labor market prior to the sons' entry. Once a son enters an occupation, however, he will be exposed to a broader range of occupational information.

Most people do not change occupations very frequently during their careers, but some, with low commitment due to the short period of time they have been employed or for other reasons (see Lin, Ensel, and Vaughn, 1981) are liable to act on newly available information and move to some other position, perhaps further removed from their fathers' situs. Because movement of this type typically occurs some time after the sons' initial entry, the sons found within situs should be, on average, younger than those not in a situs group. We may therefore formulate a hypothesis about the age of sons in their fathers' situs:

> Sons within their fathers' situs will be younger than sons not within their fathers' situs.

In testing this hypothesis we examine each of the four intergenerational data sets as a unit rather than focus on particular occupations. The characteristics of in-situs sons are compared to those of out-of-situs sons.

To test this hypothesis we use the sampling distribution of the difference between two means. With this model we may calculate the probability of obtaining a particular difference between two group means by chance if they are both actually reflecting the population mean. This procedure may be found in Herzon and Hooper (1976: 201-208).

In Table 8.8 the mean and standard deviations of in-situs sons are compared to those of out-of-situs sons for each of our four intergenerational data sets. Since we have specified a direction (in-situs sons will be younger) a test statistic of -1.65 or less is needed to reject the null hypothesis.

Table 8.8
Mean Ages
In-Situs and Out-Of-Situs Sons

Base	In-Situs			Out-Of-Situs			Test
Year	N*	Mean	St. Dev.	N*	Mean	St. Dev	Statistic
1850	130	31.14	8.29	164	31.64	8.88	-.50
1860	180	31.92	8.97	209	31.13	8.47	.89
1870	129	32.22	8.71	173	33.05	9.70	-.78
1880	154	32.42	9.29	236	32.92	9.44	-.52

*For both categories, number reported exclude those with a missing age report - see Chapter One.

As can be seen, in no case does the test statistic indicate that the difference between the means is significant. In only one case, 1860, is the difference between the means positive, however.

Before accepting the null hypothesis of probable randomness, it is worthwhile to examine sons' age in cases of occupational succession and direct connections compared with the age of sons out-of-situs. A different picture emerges in this context, as seen in Table 8.9.

Table 8.9
Age Differences
Occupational Succession and Direct Connections
Compared to Out-Of-Situs Sons

Base Year	Succession N	Succession Mean	Succession St. Dev.	Direct N	Direct Mean	Direct St. Dev.	Test Statistic* Succ.	Test Statistic* Direct
1850	73	31.30	7.78	57	30.93	8.97	-.30	-.52
1860	100	34.15	9.43	80	29.14	7.54	2.72	-1.94
1870	68	33.43	8.93	61	30.87	8.33	.29	-1.68
1880	71	34.03	9.23	83	31.04	9.17	.88	-1.59

*Occupational succession and direct connections are compared to out-of-situs sons' ages reported in Table 8.8.

This table indicates that there is considerable difference between occupational succession and movement to an occupation with direct career connections to the fathers' occupation. For succession, the difference between the means is positive in three cases, with one (1860) being a significant positive difference. For direct connections, however, there is a negative difference between the means in all cases, and two (1860 and 1870) are significant negative values. These results indicate that there are two different processes of allocation at work.

If we look only at direct connections, our hypothesis can be seen to be somewhat supported. Occupational succession, on the other hand, indicates that the hypothesis is not only incorrect, but backwards! These findings may be due to the particular way that many occupations were inherited during the period studied. (For some discussion related to this point, see Sewell (1976) and Main (1977)).

In the case of those occupations that involved ownership, such as farming or working proprietorships, sons were constrained from taking over their fathers' positions until these were relinquished through retirement or death. In addition, a father with more than one son would normally transfer ownership to his oldest son Those sons, although there are more than likely some cases where the older son established himself in an occupation other than his father's. Those sons who did take over the occupational title and capital investment of their fathers would thus probably be older than average. Sons who moved to an occupation directly connected to their fathers', however, would have no "waiting period," and would tend to be younger than those who took over their fathers' positions.

This idea is supported if we look at some of the occupations where this transfer of occupation and capital is most likely to occur. It is difficult to determine whether or not there was some form of capital investment, although an examination of the raw data gives some indication. Two occupations, farming and working proprietorships, in any event, can generally be assumed to involve some capital investment on the part of the fathers. If we look at these, we find that indeed the sons who inherit them are older than average. Table 8.10 shows the average ages, both for the total of each intergenerational data set, and for these two occupations.

Table 8.10
Average Age of Sons Who Inherited
Farmers and Working Proprietors

Base Year	Mean Age All Sons	N	Mean Age Farmers' Sons	N	Mean Age Proprietors' Sons	N
1850	31.4	294	39.6	5	31.4	7
1860	31.5	389	42.2	14	34.5	12
1870	32.7	302	36.7	11	35.6	9
1880	32.7	390	37.2	6	39.6	10

These figures indicate that these sons are much older than average. In all cases, except working proprietors' sons in 1850, the average age of the sons who inherit their fathers' occupation is much greater than the mean age of all sons.

Because of these findings, we may reformulate our hypothesis to state that:

> Sons who take a position in their father's situs will be younger than average, except where some form of capital inheritance is involved.

When we examine our raw data several occupations may be selected as ones which require some capital investment. These occupations were chosen based on the assumption that each would involve proprietorship, reputation, and/ or specialized occupational skills that could be transmitted between generations. Table 8.11 presents a list of those occupations selected from the raw data as falling into one or more of these categories.

Table 8.11
Occupations With Probable Capital Investment

Code	Occupational Title
006	Doctors
012	Lawyers
041	Working Proprietors, Retail
051	Working Proprietors, Catering
061	Farmers
064	Fishermen
072	Metal Processors
077	Beverage Processors (including small brewers)
079	Tailors
081	Cabinetmakers
082	Stone Cutters
087	Plumbers

When sons who succeeded to the above occupations are removed from the analysis, the remaining in-situs sons are seen to be significantly younger than out-of-situs sons. Table 8.12 presents these results.

Table 8.12
Age Differences of Sons
In-Situs Versus Out-Of-Situs
Capital Inheritance Sons Removed

Base Year	In-Situs N	In-Situs Mean	In-Situs St. Dev.	Out-Of-Situs N	Out-Of-Situs Mean	Out-Of-Situs St. Dev.	Test Statistic
1850	108	29.96	7.70	164	31.64	8.88	-1.66
1860	144	30.42	8.34	209	31.13	8.47	-.78
1870	103	30.98	8.31	173	33.05	9.70	-1.88
1880	130	31.30	9.31	236	32.92	9.44	-1.59

The number of sons excluded each year averages 31% of all those sons who succeeded to their fathers' occupation, with a low of 29% (21 in 1850) to a high of 35% (35 in 1860).

When we exclude those sons who probably inherited capital as well as occupation, the difference between all pairs of means is negative, and two of these difference are significant (1850 and 1870). Although these results do not strongly support our hypothesis, we accept them as showing some support and reject the null hypothesis in favor of the alternative that in-situs sons do tend to be younger than out-of-situs sons except where inheritance of capital is involved.

Another hypothesis that may be generated from our theoretical chapters involves characteristics of the occupations themselves. The information available through situs is usually informal in nature, being passed by word of mouth. Because of this, information about job vacancies that require some type of credentials or certification cannot be acted on except in very special circumstances. Consequently, we should find that situs connections are stronger where no credentials are required, and weaker, or non-existent, where they are required.

The determination of the credential requirements for occupations in our data sets is a difficult task. We may, however, make some general statements that follow the spirit of the argument. If we view the labor force as being ranked in terms of some required credentials - education, for instance - then a general measure of occupational prestige may serve as a rough indicator of these requirements. The higher the prestige of an occupation, the more likely it is to require some form of credentials. Therefore, in this section, we operationally define the degree of credential requirements for each occupation by its prestige score.

With this operational definition in hand, we may formulate a hypothesis about the mechanisms of situs movement:

> The more likely that credentials are required, the less likely will be the situs connection.

To test this hypothesis we again use the sampling distribution of the difference between two means. Since credentials are more likely to be required in higher prestige occupations, the average prestige of in-situs sons should be lower than that of out-of-situs sons. In Table 8.13, we compare the average prestige of these two groups.

Table 8.13
Prestige of Sons
In-Situs Versus Out-Of-Situs

Base Year	In-Situs N	In-Situs Mean	In-Situs St. Dev	Out-Of-Situs N	Out-Of-Situs Mean	Out-Of-Situs St. Dev.	Test Statistic
1850	131	34.26	7.57	164	35.79	10.60	-1.44
1860	184	34.21	8.71	211	35.68	10.55	-1.66
1870	159	33.98	7.22	210	38.54	11.73	-4.60
1880	155	32.37	8.47	237	34.80	10.72	-2.50

In all cases, the mean prestige of in-situs sons is less than that of out-of-situs sons, and in three cases there is a significant difference between the two means. This finding indicates that the occupations held by sons who remain in their fathers' situs are lower in prestige and probably have fewer credential requirements than occupations held by sons who are not in their fathers' situs. Therefore, we may reject the null hypothesis that there are no differences, and support the alternative that the more likely are credential requirements, the less likely is a situs connection.

Unlike the case with age, with credentials we may also examine movement from the perspective of the father. Since we are stating that the existence of credentials inhibits situs movement, then those fathers with probable credentials should have fewer sons entering their situs group than fathers whose occupations do not require credentials. We find that this is generally the case, but the differences are weaker than in the case of sons. Table 8.14 examines the mean prestige values of fathers whose sons remain in their situs compared to fathers whose sons do not remain in their situs.

Table 8.14
Fathers of In-Situs Sons
Versus
Fathers of Out-Of-Situs Sons
Mean Prestige

Base	In-Situs			Out-Of-Situs			Test
Year	N	Mean	St. Dev.	N	Mean	St. Dev.	Statistic
1850	131	36.24	8.49	164	38.01	12.34	-1.45
1860	184	35.26	8.45	211	35.39	8.88	-.22
1870	159	33.95	7.26	210	34.12	6.66	-.23
1880	155	35.75	8.08	237	34.42	7.29	1.66

This table shows that, for fathers, the difference between mean prestige values is weaker than that for sons, and in 1880 there is a significant positive difference between the means. With these findings we cannot reject the null hypothesis that credentials are not important. This finding, however, may be due to the influence of inheritance of capital, as discussed earlier. If we omit those fathers whose occupations probably involve capital investment and whose sons succeeded them to their occupations, the results support our hypothesis. Table 8.15 presents the mean prestige of fathers when those with inheritance of capital are removed.

Table 8.15
Fathers with In-Situs Sons
Probable Capital Inheritance Removed
Prestige

Base Year	Remaining Fathers N	Mean	St. Dev.	Test Statistic*
1850	109	35.06	7.85	-2.40
1860	148	33.05	6.30	-2.92
1870	130	31.79	4.48	-3.86
1880	131	34.46	7.15	.05

*The mean prestige of Fathers whose sons were out-of-situs may be found in Table 8.14

With inheritance of capital removed the mean prestige of fathers with in-situs sons is significantly lower than that of Fathers of out-of-situs sons in three of four cases. Removing capital investment shows that the fathers, too, are in positions that require few credentials. Consequently, we may support our hypothesis that the more likely credentials are required, the less likely is a situs connection between occupations.

Prior to shifting our focus to a more conventional mobility analysis, we might look at one other aspect of prestige. We have previously noted a presumed correspondence between prestige level and probable credential requirements, and have looked at this relationship in terms of the mean. If we further decompose the prestige scores into a series of categories, an interesting and supporting picture emerges. Table 8.16 presents, for both fathers and sons, the proportions found in situses for various increments of prestige. The particular increments chosen reflect natural breaking points in the prestige distribution.

Table 8.16
Proportions of In-Situs Reports
By Prestige Increment
Fathers and Sons

Prestige Ranges

Base	<= 30		31 - 39		40 - 49		50 = >	
Year	Son	Father	Son	Father	Son	Father	Son	Father
1850	.27	.33	.56*	.48	.49	.69*	.18	.19
1860	.38	.37	.54*	.49	.52	.56*	.23	.30
1870	.43	.43	.52*	.43	.37	.47*	.07	.25
1880	.28	.28	.46*	.40	.34	.49*	.18	.42
Ave.	.34	.35	.52*	.45	.43	.55*	.17	.29

The highest proportion for each year for both fathers and sons is indicated by an '*'.

This table indicates that, for sons, the highest situs connections are found with occupations in the 31-to-39 prestige unit range. For fathers, the highest situs connections are in the 40-to-49 prestige unit range. For both, the lowest connections are in the 50 or more prestige unit category.

It is also interesting to note that the second lowest proportions for both fathers and sons occurs in the 30 or less range. These low figures may indicate that a negative information flow is occurring. Perhaps because of the low prestige involved, fathers may have been transmitting information that their occupation would not be a desirable position for their sons. If this were the case the proportions found in this table would be expected.

We noted that the largest proportions of traces for fathers with in-situs sons occurred in the 40-to-49 unit range. This seems to fly in the face of our hypothesis about the requirements of credentials. However, it will be recalled that inheritance of capital was prevalent in this period. If we leave out this type of inheritance, the proportions again conform to the expected distribution, except for those in the less than 30 unit range. Table 8.17 presents the proportions traced to situses for fathers and sons when those who are involved in capital inheritance are removed from the analysis (see Table 8.11).

Table 8.17
Proportion of In-Situs Reports
By Prestige Increments
Probable Capital Inheritance Removed
Fathers and Sons

Prestige Ranges

Base Year	< = 30 Son	< = 30 Father	31 - 39 Son	31 - 39 Father	40 - 49 Son	40 - 49 Father	50 = > Son	50 = > Father
1850	.27	.32	.51*	.45	.30	.58*	.13	.15
1860	.38	.37	.52*	.50*	.24	.35	.13	.18
1870	.44	.43*	.50*	.41	.13	.18	-0-	-0-
1880	.39	.32	.43*	.38*	.09	.36	.14	.36
Ave	.37	.36	.49*	.44*	.19	.37	.10	.17

The highest proportion in each category is denoted by an '*'.

As can be seen, the proportions of situs connections fall more in line with our hypothesis of decreasing connection with increasing prestige. The low proportions in the 30 or less columns do not change, and they remain lower than the 31 to 39 prestige unit column in all cases but one (fathers, 1870). The various ramifications of this pattern will be discussed in the concluding chapter. In any event, when we exclude capital inheritance, the proportions conform to our expectations.

Section IV - Situs and Intergenerational Mobility

The final area to be examined in this chapter involves an analysis of how situs may be seen in the context of intergenerational mobility. To do this we first explore mobility in a conventional format, noting various regularities and changes that occur in our four data sets. Following this, we examine the influence of a changing occupational structure on situs connections.

There are many ways in which the occupational structure may be decomposed for conventional analysis. The Edwards (1943) scale is in common use (see Breiger, 1981), as are a number of other models. For comparative analysis of our data the best approach is one based on prestige, primarily due to ease of manipulation but also because prestige or its associated values are the measures normally used in mobility studies (see Chapter Three).

For our analysis we break the labor force into a three-class model: upper, middle, and lower. The cutting points for this breakdown are: Lower - prestige scores of 30 units or less; Middle - prestige scores from 31 to 39 units; and Upper - prestige scores of 40 units or more. We have chosen these cutting points because they reflect natural breaking points in the prestige distribution (see Carlsson, 1958). The results obtained in the previous section, using the same breakdown, may give us additional insights in this mobility analysis. It is interesting to note that, when broken down in this way, the resulting proportions for each of the four sets follow closely the proportions .25-.50-.25. This diamond shape mirrors current thinking on the structure of social inequality (see Vanfossen, 1979). It can be argued that this structure might not be found during the nineteenth century, but since there is no reason to presuppose a given distribution, this division is retained.

Our analysis is conducted strictly in terms of outflow, examining the sons' placement by the various categories of the father. This is the conventional procedure in mobility studies. Following this presentation the situs dimension is explored.

In each of our data sets we placed both fathers and sons into one of the "classes" noted above according to the prestige score of their occupation. For each class of the father, we then determined how many sons fell into each of the three class categories. Tables 8.18 to 8.21 present both raw numbers and proportions for each data set. The reported proportions are of the row totals, since this is an outflow analysis.

Table 8.18
Father to Son Prestige Mobility
Three Class Model
1850 Fathers (Source) to 1870 Sons (Destination)

S			Destination		
o		Upper	Middle	Lower	Total
u	Upper	34 (.41)	19 (.23)	29 (.35)	82 (.99)
r	Middle	23 (.15)	98 (.63)	34 (.22)	155 (1.00)
c	Lower	5 (.09)	32 (.55)	21 (.36)	58 (1.00)
e	Total	62	149	84	295

Table 8.19
Father to Son Prestige Mobility
Three Class Model
1860 Fathers (Source) to 1880 Sons (Destination)

S			Destination		
o		Upper	Middle	Lower	Total
u	Upper	45 (.46)	21 (.21)	32 (.33)	98 (1.00)
r	Middle	33 (.16)	111 (.54)	61 (.30)	205 (1.00)
c	Lower	19 (.21)	41 (.45)	32 (.35)	92 (1.01)
e	Total	97	173	125	395

Table 8.20
Father to Son Prestige Mobility
Three Class Model
1870 Fathers (Source) to 1890 Sons (Destination)

S			Destination		
o		Upper	Middle	Lower	Total
u	Upper	40 (.57)	21 (.30)	9 (.13)	70 (1.00)
r	Middle	54 (.25)	107 (.50)	54 (.25)	215 (1.00)
c	Lower	15 (.18)	34 (.40)	35 (.42)	84 (1.00)
e	Total	109	162	98	369

Table 8.21
Father to Son Prestige Mobility
Three Class Model
1880 Fathers (Source) to 1900 Sons (Destination)

Source		Destination Upper	Middle	Lower	Total
	Upper	33 (.36)	21 (.23)	38 (.41)	92 (1.00)
	Middle	38 (.17)	101 (.46)	80 (.37)	219 (1.00)
	Lower	10 (.12)	23 (.28)	48 (.59)	81 (0.99)
	Total	81	145	166	392

In most mobility tables (see Miller, 1960) the diagional entries, indicating immobility, have the highest proportions, with declining proportions in the cells as their distance from the diagional increases. This pattern is also found in these tables. The largest proportions for each row in each table fall on the diagional, with three exceptions. Two of the exceptions to this pattern occur in the 1850 and 1860 sets for the lowest prestige group. In both instances the largest proportion of sons appear in the middle prestige group, with the lower prestige group - the one on the diagional which we would expect to be highest - having the second highest proportion. The third exception occurs in the 1880 set, where the largest proportion of sons of upper prestige fathers appear in the lowest category.

These exceptions are a reflection of the changing occupational structure of the community, and of the intensification of capital that occurred during this time span. To look at the last exception first: In the 1850s and 1860s a large proportion of the upper prestige group were owners of various business establishments and manufacturing plants. By 1880, however, there were very few owners of moderate or large sized establishments, the majority of the upper prestige group being composed at this time of shop owners, farmers, and professionals. For example, owners of large establishments comprise 21% of the upper prestige group in the raw data from 1850. By 1880 this had shrunk to less than two percent. Shop owners, on the other hand, comprised 27% of the upper group in 1850 and 38% in 1880. The sons of shop owners, waiting to take over their fathers' positions, would usually hold low prestige jobs - shop assistants or clerks. Thus, due to the changing composition of the upper group (and increased life expectancy), a greater proportion of these sons would be expected to fall into the lower prestige category. These positions, of course, would be exchanged for higher prestige jobs once the sons took over their fathers' concerns.

The movement of the sons of the lower prestige group into the middle group in 1850 and 1860 most likely reflects the effects of the Civil War (the 1850 set) and the expansion of the industrial base that occurred prior to 1880 (for the 1860 set). The sons traced from 1850 would have entered the labor market around the time of the Civil War (average age of sons of 1850 fathers in 1860 would be about 21 years), when the Portsmouth labor market doubled in size, briefly, before returning to the previous level. The sons who entered the labor force prior to the influx of new workers would be propelled into higher prestige positions by the numbers of unskilled workers who flocked to the community with the war boom (see Chapter Two). Despite a subsequent reduction in the size of the labor force many of these sons could have retained their positions, thereby increasing their proportion in the middle group. The sons of 1860 fathers may partially have followed this pattern, but more than likely they took advantage of the creation of new middle-level positions in the industries that were developing during the decades following the war.

These exceptions aside, there are several other features of these tables that bear noting. In all tables the "most difficult" group to enter is the upper prestige group, except for those sons whose origin was here. The "easiest" group to enter is, of course, the lower prestige group. This pattern is again reflected when we look at directional mobility.

Directional mobility, as we use the term, refers to the proportion of sons who move either up or down, based on the total number of non-diagional entries. As such, the proportion who move up plus the proportion who move down will total one, encompassing all movement. It can be argued that the diagional entries may also be moves, since we are dealing with categories, but for this analysis we assume that these men are actually stationary. Table 8.22 presents these directional proportions.

Table 8.22
Directional Movement of Sons
Proportions of All Non-Diagional Entries

Base Year	Upward N	Upward Moved	Downward N	Downward Moved	Total Mobile	
1850	60	.42	82	.58	142	(1.00)
1860	93	.45	114	.55	207	(1.00)
1870	103	.55	84	.45	187	(1.00)
1880	71	.34	139	.66	210	(1.00)

As shown, in all years but 1870 downward prestige mobility predominates. The finding for 1870 may actually be reflecting the data problems found in the 1870 - 1890 trace set (Chapter One). Blau and Duncan (1967) noted that men who remained in their community of birth usually attain lower prestige positions than do men moving into the community. This downward trend is ameloriated owing to the changes in the occupational structure that were occurring (Chapter Six) whereby sons were moving, generally, into white collar occupations because of the industrialization that was under way during this time period.

With this brief look at mobility we may move on to see how situs fits into this pattern. The discussion so far has focused primarily on the influence a changing occupational structure has on a conventional mobility analysis and, although changes occur, they are minimal. There is a trend toward increased downward mobility, but generally the tables indicate little change in mobility patterns between the 1850 and 1880 data sets. But what effect does this changing structure have at the level of network connections within the labor force?

The situs connections that we have been discussing are attempts to tap into the interaction networks that were operating during the period studied. If there is a breakdown in the information available within fathers' situses due to the influence of structural factors, then this will be reflected by a reduced number of moves occurring within the situses of the occupations involved. We expect a reduction in the number of situs connections to higher prestige positions due to the concentration of capital and a corresponding increase in situs connections to lower prestige positions. This downward movement would likewise be fueled by the increasing demand for factory workers which developed at the end of the century.

To look at situs in the context of conventional mobility analysis we maintain the same prestige categories used in our mobility analysis. Here we report the raw number of traces within situs and the proportion these are of the corresponding cell in the mobility tables (Tables 8.18 to 8.21). For example, if cell U-L (Upper father, Lower son) in the situs table (8.23) for 1850 has 12 entries, and the same cell, U-L in the mobility table (8.18) for the same year has 29 entries, then this number, 29, is divided into the number of situs traces for that category to arrive at the proportion of moves that are situs connected (.41). Tables 8.23 to 8.26 report these results.

Table 8.23
Situs Proportions of Mobility
Three Class Model
1850 Fathers (Source) to 1870 Sons (Destination)

		Destination			
S					
o		Upper	Middle	Lower	Total
u	Upper	20 (.59)	6 (.32)	12 (.41)	38
r	Middle	5 (.22)	68 (.69)	1 (.03)	74
c	Lower	0 (-0-)	9 (.28)	10 (.48)	19
e	Total	25	83	23	131

Table 8.24
Situs Proportions of Mobility
Three Class Model
1860 Fathers (Source) to 1880 Sons (Destination)

		Destination			
S					
o		Upper	Middle	Lower	Total
u	Upper	32 (.71)	6 (.29)	12 (.38)	50
r	Middle	8 (.24)	75 (.68)	17 (.28)	100
c	Lower	3 (.16)	13 (.32)	18 (.56)	34
e	Total	43	94	47	184

Table 8.25
Situs Proportions of Mobility
Three Class Model
1870 Fathers (Source) to 1890 Sons (Destination)

		Destination			
S					
o		Upper	Middle	Lower	Total
u	Upper	24 (.60)	7 (.33)	0 (-0-)	31
r	Middle	6 (.11)	63 (.59)	23 (.43)	92
c	Lower	2 (.13)	14 (.41)	20 (.57)	36
e	Total	32	84	43	159

Table 8.26
Situs Proportions of Mobility
Three Class Model
1880 Fathers (Source) to 1900 Sons (Destination)

		Destination			
S					
o		Upper	Middle	Lower	Total
u	Upper	20 (.61)	2 (.10)	22 (.58)	44
r	Middle	2 (.05)	59 (.58)	27 (.34)	88
c	Lower	2 (.20)	6 (.26)	15 (.31)	23
e	Total	24	67	64	155

In every case in these tables, the diagional entries have the highest proportion in each row. This is a reflection of the importance of occupational succession, as noted in Section III. It also indicates that informal contacts occur most strongly when the salience of information - its visibility - is high, a finding from Section II.

These tables also show interesting features of mobility as well as immobility. The lowest proportion of situs traces occurs in the upper prestige category, a finding indicating that there are few actual connections to these occupations by men outside of the group (see for example cells U-L and U-M in Table 8.25). Movement into the upper prestige positions would tend to be more formalized, with the requirement of some form of credentials, and hence more difficult for sons whose origins are not in this group. On the other hand, the most permeable group in terms of situs connections is the lower prestige group (for example, cells L-U and I-M in Table 8.26). Here, where no credentials are required, informal contacts would have the greatest effect.

It will be recalled from the last section that we found the majority of situs connections within what we are now calling the middle prestige group (see Table 8.17). This pattern is still evident here, as illustrated by the marginal totals. When we look at movement off the diagional, however, the greatest proportions occur within the lower prestige groups.

We find too that with upper prestige fathers, in three of the four sets, the proportion situs-connected to the lower prestige group is greater than the connection to the middle group. This lends support to our supposition about the contact between shop-owning fathers and their shop assistant sons. The largest proportion traced from upper fathers to lower sons occurs in the 1880 set. Proportions traced in this fashion in the 1850 and 1860 sets are smaller than those in the 1880 set, but show a similar pattern. The 1870 set, as has been noted, is slightly flawed.

To conclude this examination, we investigate how situs is mirrored in directional mobility. Recall from Table 8.22 that downward moves were generally more prevalent than upward moves. A similar pattern in situs connections would serve to support the supposition that the importance of network contacts decays with an increasing formalization of the labor force. Since we have been examining the proportions situs connections are of our mobility tables, a similar approach is used here. We first total the number of upward or downward moves in our mobility tables, then divide this figure into the corresponding totals from Tables 8.23 to 8.26, the number of moves that were situs-related. Table 8.27 presents these results.

This table illustrates the impact of increasing formalization of the labor market. In 1850 both proportions are the same, indicating that informal contacts were as

Table 8.27
Directional Mobility
Situs Proportion of Mobility
Mobile Sons Only

Base Year	Of Upward N	Proportion	Of Downward N	Proportion
1850	14	.23	19	.23
1860	24	.26	35	.31
1870	22	.21	30	.36
1880	10	.14	51	.37

likely to be utilized for upward as for downward moves. By 1880, however, this had changed to such an extent that informal contacts were about three times as likely to lead to downward mobility than to upward. The development of this process over time is clearly illustrated in this table.

This section has demonstrated that situs connections, in the context of intergenerational mobility, primarily occur in an informal context. They are much stronger within the lower prestige groups, and weaker in the upper prestige groups. While these contacts do not "cause" mobility, the findings indicate that when utilized, their net effect is to perpetuate an existing pattern of inequality.

The measurement of situs connections between occupations (Chapter Six) was based on the career movement of the entire labor force. Within this pattern intergenerational movement was shown to be strongest in cases of occupational succession. The effect of this regularity would be to maintain the existing structure of inequality. The second strongest influence of situs occurs when movement is downward, an effect that could serve actually to increase inequality. The net effect of situs, then, is to perpetuate or increase inequality, especially in an expanding labor market such as the one examined here. Consequently, when a son takes a position about which he has adequate information and a personal recommendation (or at least implicit recommendation by receiving the information - see Chapter Three) he is actually decreasing his chances to advance his position in relation to his father. This point is further discussed in the concluding chapter.

<u>Summary</u> - This chapter has tested some of the hypotheses that may be generated from our theoretical chapters and has looked at situs movement in the context of a conventional mobility analysis. We found that our hypotheses, with some modifications, are supported, and that situs operates in predictable and interesting ways in intergenerational mobility.

We found that we could support our original conceptualization of situs only when it was modified to encompass primary, but not secondary, networks. We also found that situs connections were strongest for both the younger members of the community, and for those groups where credential requirements were few.

When we examined intergenerational mobility we saw that situs operated most strongly for occupational succession.

Additionally, it varied with a postulated formalization of the labor market - the more formal the market, the fewer situs connection to higher prestige positions and the more to positions of low prestige.

This chapter has been testing a particular theoretical perspective. We have stated that the information available within the father's occupation about the local labor market will be the information most likely to be acted on by the son in his initial entry into the labor force. The information available to the father we inferred from the career interconnections of men who were changing their jobs within the labor force at the time of the sons' entry. In this perspective, restricted information would cause particular patterns of mobility to be evidenced by these entrants. With some minor modifications, this perspective was supported.

In the next chapter these findings are discussed in some detail. The usefulness of the concept of situs is examined, along with some discussion on how this conceptualization may be tested in the current labor market.

PART FOUR

CONCLUSIONS

INTRODUCTION

The results of this study have been presented in three unequal parts. In the first the data base was addressed, describing a procedure for developing and correcting historical data derived from manuscript United States census schedules and city directories. We examined the history of Portsmouth, the physical location from which the data were drawn, and its demography. This latter information explained a number of changes in the occupational structure of the community that would otherwise have been difficult to interpret.

In the second part we were concerned with the conceptualization of the labor market as a textured entity, with a primary focus on the idea of network connections. The available research on networks and employment strongly suggested that whom a man knows, where he lives, and where he works influence both the information available to him about position vacancies and his career mobility. With this as a base, the concept of situs was introduced as the information-sharing component of an occupation encompassing both itself and all other occupations connected to it by effective networks. On the assumption that the most salient information about vacant positions available to a new entrant into the labor force would generally come from the entrant's father, it was hypothesized that the situs of the father's occupation should have a major influence on his son's entry into the occupational structure. If the concept of situs was valid, a particular pattern of intergenerational mobility should be evident in the data.

In the third part of this study the situs approach was tested. First, the most probable network connections between occupations were determined on the basis of the career interconnections established by members of the labor force during four overlapping twenty-year periods. Using this information to determine whether or not sons remained within their fathers' situs, we derived and examined intergenerational mobility data. In this perusal changes in the occupational structure, as reflected by the data, were compared to the historical development of the community and it was seen that the data documented both the nationwide shift to white collar occupations that was occurring during the period and the specific changes in the industrial composition of the community.

The original conceptualization of network connections suggested that both occupations with direct career links to a particular occupation, and also occupations with indirect links (analogous to friends-of-friends) to that same occupation, should show a greater than random pattern of connection between fathers' and sons' occupations. However, this extended pattern was not found to be the case, since only directly linked occupations showed significant connection. The original conceptualization also indicated that the farther removed from the father's occupation other occupations were, the less frequent would be intergenerational moves to these occupations. This was shown to be the case, the traced sons moving less frequently to indirectly connected occupations than to directly linked occupations, or to the same occupation as the father.

More specifically, sons who remained in their fathers' situs were both younger, and were in occupations that required fewer credentials, than were those sons not in their fathers' situs. This was not a clear pattern, however, until the influence of the inheritance of capital was removed.

Throughout this project the primary concern has been the concept of a textured occupational structure. In sociology, the prevailing view of the occupational structure is of an undifferentiated entity. People with equal status or prestige scores have equal potential for advancement. The occupational structure is viewed as having the shape of a pyramid or diamond, with ladders or ramps running up and down the structure between various status levels. With the concept of situs the occupational structure is regarded as complex of textured occupational groupings, and the information available within them, all comprising a labor market. People with equal status or prestige scores have unequal potential, because of their location within an occupational group. The occupational structure is still seen as having a diamond or pyramid shape, but various groups control the information about where the ladders and ramps are located, and control access to them.

Throughout the rest of this chapter the concept of a textured occupational structure is explored. In the first section the various findings from the analysis chapter (Chapter Eight) are discussed, with note of problem areas and a discussion of issues raised in the analysis. Various theoretical issues are also examined, and an attempt is made to fit situs into conventional theoretical perspectives. The second section critiques the methods and techniques used in this study and offers some suggestions for a more rigoerous study. The third and final section discusses how the theory of situs might supplement the basic conceptual model of mobility, and briefly discusses some policy issues raised by this concept.

CHAPTER NINE

CONCLUSIONS

Section I - Situs and Intergenerational Mobility

Given the data used in this study a specification of the actual network connections within the labor force is impossible. Networks are formed and maintained on the basis of some form of communication - usually informal in nature. The data do not contain information on such communication. Rather, they contain information on what career changes were experienced by men within the labor force, and it was assumed that this type of connection - men moving from one occupation to another - would mirror the underlying network connections.

With criteria founded on the proportionate movement of men among occupations during their careers (Chapter Five), every man who could be traced to a point twenty years beyond his original appearance in the data as the son of an employed father was noted as being either a) in the same occupation as his father (succession); b) in an occupation with direct career links to his father's occupation (direct connection); or c) in an occupation with indirect links to his father's occupation (indirect connections - occupations directly connected to occupations directly connected to his father's occupation). Both (a) and (b) comprise the primary network of the father's occupation, and (c) makes up the secondary network (Chapter Seven).

The analysis of situs groups revealed that sons moved to occupations in their fathers' secondary networks no more than would be expected under conditions of random movement. Primary networks, however, were found to contain significantly more sons than would be expected by chance movement.

When the social distance of intergenerational moves was examined the greatest proportion of sons stayed within the same occupation as their father (the same in terms of SIOP minor group), the second greatest proportion of sons was in occupations with direct career connections to their fathers' occupations, and the smallest proportion was found when sons moved to indirectly connected occupations. This latter group displayed the same patterns of movement that would be found were a random allocation process at work.

Restricting the analysis to comparisons between sons in their fathers' primary network (those in situs) with sons outside of this network, it was initially found that the average age of these two groups was roughly similar. However, during the period examined there were still many independent craftsmen and merchants, among others, who could convey advantages other than information to their sons in the form of capital. This fact allowed a further comparison between the groups with these sons excluded, based on the reasoning that occupational succession involving capital inheritance is a distinct process which would make network information redundant. With this exclusion, it was found that in-situs sons were significantly younger than those sons who were outside of their fathers' situs.

In this same context, it was also found that in-situs sons were in occupations with fewer credential requirements than those sons who were out-of-situs, even without controlling for capital inheritance. Fathers whose sons remained in their situs also had fewer credential requirements than fathers whose sons went into other occupations. This latter relationship was only significant, however, when those involved in capital inheritance were removed.

When consideration shifted to the context of conventional mobility analysis, the situs concept continued to be supported but some results were unexpected. In the conventional analysis, typical patterns of mobility were found. Most sons remained in the same "class" as their father and the higher class positions were more difficult to enter than any other. Basically, the mobility trend throughout the period examined was toward downward mobility: as the century progressed, there was increasingly more downward than upward mobility for all sons traced intergenerationally. This pattern, expected for sons who remained in the community based on Blau and Duncan (1967: Chapter Seven), was seen to be even stronger for those sons who remained within their fathers' situs. However, it was noted that for in-situs sons, the lower class group did not experience the greatest situs connection, as would be expected in light of their low credential requirements, but rather the middle class group had the highest situs connection, followed by the lower and upper class in that order.

These various findings need to be addressed more fully, both to place them in context and to explain the anomolous results. First, situs is discussed using the various findings that support this perspective. Following this, findings that do not fit into the expected pattern are addressed.

Network connections, as discussed in Chapters Three and Four, are useful sources of information about vacancies only in particular circumstances. The information must be about positions for which the recipient is qualified and the information must reach him in the short period of time before the vacancy is filled by someone else. When a son initially enters the labor market the most salient information available about that market comes from his father.

If labor market information available to sons seeking first jobs is restricted because they are not yet in that market and because of their fathers' placement in a particular situs within a textured occupational structure, then it would be expected that the sons would be found disproportionately within the situs of their fathers' occupation. The results support this supposition.

The analysis did not control for age, and the sons who appear in the intergenerational data sets range in age from 20 to over 60 years old. With this broad range of ages, a further exploration of the influence of situs is possible. As noted above, prior to entry a son has restricted information about the labor market. Once he is employed, however, a wider range of information becomes available. Due to several factors, such as upward striving for increased prestige or income, the son is liable to act on this newly available information to move at some point to another occupation, perhaps further removed from his father's situs. Consequently, sons found within their fathers' situs should be younger than average, reflecting less time available to change positions. This too is supported by the results in Chapter Eight.

Further, sons would be unable to enter positions that require credentials or training that they do not possess. This would lead to the possession of fewer credentials on the part of in-situs sons than sons who were outside of their fathers' situs because training requirements for these positions would be obtained in a context outside of the family. Conversely, fathers whose occupations require credentials should have greater difficulty in placing their sons within their situs due to the specific training required. Both of these expectations were supported, but only when capital inheritance was removed.

There were several expectations not supported by these findings which need to be addressed.

It was postulated, on the basis of Granovetter's (1974) findings that secondary contacts (Chapter Three) predominated in transmitting vacancy information that was acted on, that an occupation's situs would include occupations indirectly connected to this occupation (occupations with a direct connection to another occupation directly connected to the father's). In the data examined here this was not supported: sons moved to occupations indirectly connected to their fathers' no more than would be expected within a random allocation process. Although this finding may reflect reality, it may be a result of the period examined.

Vacancy information, especially about positions that require few credentials, would normally be valid for only a short period of time. Since the information available within the secondary networks would have to be given to the father before it could be utilized, if there were delays in transmitting this information, by the time it reached the potential job-holder, it could already be out of date. The speed of transmission is an important consideration.

In current society all that usually must be done to contact anyone in the country is to pick up a telephone. In Portsmouth telephones were not introduced until 1880 and it was many years before they were in wide spread use. Consequently, vacancy information would have to be physically brought to the intended recipient. Given the nature of jobs that show high situs connections (jobs that do not require credentials) the available positions could have been taken before their availability was known to a man in an occupation only indirectly connected to the one where the vacancy occurred.

About the same time that telephones were introduced into the community there was also the introduction of the streetcars. This indicates that during the later part of the study period communications would have been generally more rapid than during the earlier part. In Table 7.1 (Chapter Seven), where the percentage of sons in indirectly connected occupations is presented, the number of sons found in these indirectly connected occupations shows an increase over time. For sons reported in 1880, 15% were in occupations indirectly connected to their fathers'. For sons reported in 1890, this increases to 20% and stays at that level for sons reported in 1900 (21%). This indicates that as the efficiency of communication increased so did the number of sons who were in occupations which were indirectly connected to their fathers'.

It is surmised that the primary reason for the lack of a significant number of sons found in occupations indirectly connected to their fathers' is the lack of communication facilities. (An alternate explanation may be that the number of position vacancies increased in this latter period, allowing for a longer vacancy period. Throughout the project, however, we have been assuming a constant demand structure.) In today's labor market there are more than adequate facilities, and these are probably utilized to transmit this type of information. Consequently, the finding of no situs connections to indirectly connected occupations in the late nineteenth century might not apply to the current labor force.

Another area that needs to be addressed is that of capital inheritance. Significant results were only obtained in regard to the age of in-situs sons and to the credential requirements of fathers' occupations when those involved in capital inheritance were removed from the analysis. The list of those occupations that we assume involved some capital inheritance (Table 8.11) included professional (doctor), sales (working proprietor), agricultural (farmer), and craft (cabinetmaker) positions. For all but the professional positions, the assumption of capital inheritance is based on the reasoning that there are necessary "tools of the trade" used in the execution of the occupational duties, tools which would require various amounts of capital to purchase. In the case of farmers, this could be land; for working proprietors, store stock; and for craft positions, the physical tools and specialized skills needed to practice the craft. For proprietors and craftsmen especially, reputation would also be an important aspect that could be transmitted intergenerationally. For these occupations, the inheritance of capital may readily be seen as conferring some advantage to the sons.

In the case of professional positions, doctors and lawyers, the inherited capital would have a different form. During the period covered in this project a pattern of increasing state control over most professional positions can be seen, accompanied by a dramatic increase in the availability of higher education. Prior to and immediately following the Civil War, it was common for men to apprentice for professional positions, receiving little or no formal education (Norwood, 1944). Sons of professionals would have considerable advantage within this apprentice system. It is likely that vestages of the system survived into the late 1800s, and the training received by the sons would probably increase their chances of obtaining the formal credentials required to practice the profession. Hence, the skills held by these fathers can be seen as the capital to be inherited.

By controlling for inheritance of capital in this analysis an attempt has been made to bring the findings more in line with what would be expected in contemporary society. Currently capital inheritance as a component of occupational inheritance plays a much smaller part than in the nineteenth century. This is due both to the decrease in the proportion of working proprietors in the labor force (Vidich and Bensman, 1968) and the increased formalization (educational credentials) of the labor market. The inheritance of capital still plays a role in mobility but its form has changed in current society from a direct connection through occupation (father to son) to conferring the ability to purchase valued educational credentials for the son.

The final aspect of contradictory findings to be discussed is that situs connections occurred predominantly in middle-prestige positions. The theory of situs would predict that the lower-prestige group should show the most situs connection. There are two possible explanations for this finding.

One reason for this result may be that the fathers were unhappy with their work. "Unhappy" here means that the work is unrewarding, repetitious, dangerous, and generally undesirable. Consequently, fathers in these positions could have either purposely avoided transmitting vacancy information to their sons or, through the normal socialization process, they could have been communicating the idea that the positions were simply undesirable. In both cases, the result would be that little situs connection should be evident.

Another possibility is that because of their nature these low-prestige positions would be vacated by the son as soon as possible. If a father in a low-prestige position transmitted vacancy information to his son about a job within his situs the son could take the position. Once in that occupation the son would have a broader range of information available about the labor force, and might be more liable to act on this information once he was in the job market. If a "better" job came alone, he would most likely take it.

If this were the case the situs connections within the lower prestige positions would be short-lived. Since the data were gathered at five-year intervals, the sons would have had ample time to find and enter more desirable positions. Therefore it is possible that these positions do indeed have the greatest situs connection, but this connection decays too rapidly for the data to document.

As discussed, the contradictory results found in the analysis can be explained by the period studied and by the structure of the data base. With a contemporary data base these findings should not be evident. In a later section a proposal for the gathering of such a data base is discussed. Prior to this, situs and its theoretical implications are explored.

Section II - Situs and Theory

What are the implications of the situs perspective in terms of stratification theory? Several disparate elements presented earlier are brought together here to form an alternate conceptualization of the occupational structure. This conceptualization is then compared to the two major theoretical perspectives on stratification. Finally, situs is examined in the context of the conventional status-attainment model of Blau and Duncan (1967).

A useful point of departure for the conceptualization of situs is that of the segmented labor market. In this perspective the labor market is seen as composed of a number of segments, each characterized by different work conditions, compensations, potentials, and career mobility patterns (Edwards, 1977). Although the segmented labor market is usually discussed in terms of individuals' careers (Miller, 1982) it is also a useful perspective for examining intergenerational mobility.

The segmented labor market perspective assumes that barriers and patterned advancement paths exist within the labor market. In this approach it is possible to look at the occupational structure as being composed of a number of distinct and only semi-permeable groups. Under these circumstances an individual's placement within the structure serves to restrict that individual in some ways. Consequently, the idea of a continuously graded occupational structure no longer applies. Rather, the structure must be seen as textured, where two different people with the same status or prestige score have very unequal chances of advancement; one may see clearly demarked advancement ladders, whereas the other, with the same status, may confront an unsurpassable barrier.

This is a useful perspective for discussing situs. By combining the segmented labor market approach with that of situs, the barriers become important by virtue of the restriction of information about the labor market as well as for other reasons. The restricted knowledge of the father likewise limits the sons horizon and thereby constricts his mobility potential. Consequently, in the context of a segmented labor market, the network connections that make up the situs of an occupation would be one form the barriers take.

For some groups situs is unimportant as far as mobility potential is concerned. Fathers with large amounts of wealth or with highly rewarded positions do not have to worry about their sons' placement. In high-prestige positions, non-occupational resources can be utilized to obtain training or placement for sons, thereby circumventing the importance of situs (see Hatt, 1950). In these cases the information derived from occupational networks would not be needed for the direct placement of a son in the labor force. However, non-occupational networks probably play an important part in placing sons in the labor force.

For most groups network connections are important for the mobility potential of sons. As specified earlier, the most salient information available to fathers about job vacancies comes from their occupational situs. Consequently, the more diversified the occupations within their situs, the broader range of information will be available to their sons. Fathers in the subordinate primary labor market, for example, would generally have a broad range of occupational contacts and the contacts would be to more desirable positions than would fathers in the secondary labor market (Chapter Four).

Since the segmented labor market perspective is best seen as a conflict approach (Vanfossen, 1979), situs must also be seen in this light. Within sociology there are two opposed theoretical approaches for interpreting stratification: the structural-functional and the conflict models (Heller, 1969). Although there have been attempts to produce a synthesis of these two approaches, they have met with mixed success (see Lenski, 1966, for example). Out of the many points of friction between these two theoretical approaches, the concern here is with why stratification exists. Although situs offers a conflict perspective on this question, the concept does not really detract from the functional model.

One problem that becomes evident when comparing these two models is that each addresses a different aspect of stratification. The functional approach to why stratification exists is perhaps best expressed in the now-classical article by Davis and Moore (1945). Stratification is assumed to be "an unconsciously evolved device by which societies insure that the most important positions are conscientiously filled by the most qualified persons (p. 243)." Dahrendorf (1959), as a spokesman for the conflict approach, states that stratification exists because "every society rests on constraints of some of its members by others (p. 329)". There are other factors to be considered in both of these models, to be sure, but in addressing the question of why stratification exists, they seem to be talking past each other.

In light of this, situs cannot be seen to detract from the functionalist perspective. Situs has been shown to operate at the level of the family, and to operate most efficiently when few credentials are required for entry into a position. Since the socialization of values, the work ethic, and particular skills occur within the family, perhaps in fact the most qualified people produced are finding their way into situs-connected positions. In any event, until a definitive cuantification of the qualifications of persons and positions is developed, the idea of situs cannot falsify the functional position.

On the other hand, the conflict approach of Dahrendorf (1959) can be somewhat supported with the theory of situs. The restricted information available to members of some occupations and not to others is a basic constraint implied by the idea of situs. Although no conspiracy is necessary to restrict this information, it is in the best interest of members of some groups to protect their occupational spheres against intrusions from people outside, thereby insuring that desirable positions are available within the labor force for their sons and others like themselves.

Situs operates most efficiently when credential requirements are few. Again without hint of conspiracy, it can be suggested that it is worthwhile for some groups to insure that such remains the case. If a large number of people enter the labor force oriented to the recommendation of their families that are based on restricted information, these people will join the labor force at the same economic level as their families. Consequently there will be less competition for higher-prestige positions, less discontent among those who might attempt to take these positions, and more slots available to the children of high-prestige families.

Of the two perspectives, the conflict approach is more appropriate than the functional when situs is considered. The implications of this are that the basic status-attainment model of Blau and Duncan (1967), with its roots in functional theory (Horan, 1978), would have a difficult time accounting for the structural regularity of situs.

Since this status-attainment model has reached almost paradigmatic proportions in stratification research (Miller, 1982), the implications of situs for this model should be discussed.

In the basic Blau and Duncan model, five variables serve to describe the status attainment process: fathers' education, fathers' occupational status, sons' education, and sons' first occupational status are used as independent variables tc predict the sons' final (or current) occupational status score. Within this model, where would situs fit in?

Granovetter (Peterson, 1980) has noted that "job finding is perhaps mcst important for socieconomic achievement; it is the process by which background, education, skills, and experience are translated into occupational status." Fathers' situs would therefore enter the status-attainment model as another independent variable. Figure 9.1 presents a schematic of the status-attainment model with situs included:

Figure 9.1
Expanded Status-Attainment Model
(See Blau and Duncan, 1967: 170)

```
------------                            ------------
!  Father's!----------------->!   Son's  !
! Education!           /----->! Education!----->          ----------
-----!-----           /         -----------          >---->! Son's   !
     !           ---/             >                       ! Final   !
     !        /                    >                     >! SES     !
-----!------                       -->-------     /   ---/------
! Fathers' !------(SES)------------->!  Son's !   /      /
!Occupation!                        ! 1st SES!/      /
------------                        ----------     /
        >           -----------                  /
    (Location)--! Father's !--------------->
                !  Situs   !
                -----------
```

There are some changes in this model from the one presented by Blau and Duncan (1967). Father's occupation, in the status attainment model, reads father's SES (socio-economic status). Although SES is used as the measure of the father's and son's occupations, and situs is concerned with an occupations location in the labor market, the two approaches are not mutually exclusive. The occupation of the father can directly affect his son's occupational status through SES. In addition, by virtue of the location of the father's occupation within a textured labor market, the situs within which the father's occupation is located would provide information on the status range within which the son's first occupation would be found. The father's occupation would thus be measured in two ways (status and location), accounting for both direct influences and structural factors.

The simple inclusion of situs into this model may be seen as a case of letting "the methodological tail wag the substantive dog" (Buraway, 1977). The model itself has assumed such a major place in the field, however, that to not address it would be considered a serious flaw. The work of Blau and Duncan (1967) is a useful point of departure because several of their findings help explain a curious ramification of the influence of situs.

In the analysis chapter (Chapter Eight, Table 8.27), it was seen that over time there was greater downward mobility within situs than there was out of situs when compared to all sons who were traced intergenerationally. It was stated at that time that situs may serve to perpetuate or even increase inequality between generations. This issue needs to be addressed.

Situs was shown to operate primarily in areas where formal credentials were least important. Implied in the concept of situs is the idea of a sponsor - someone who transmits the vacancy information to the father who relays it to the son. If we explore this idea of a sponsor the reason for a perpetuation or increase in inequality between generations becomes clear.

Since most positions found through situs do not require credentials anyone should be able to take the open position. When vacancy information is transmitted by a sponsor the position will most likely be one that has rewards (prestige) equal to or less than the one held by the sponsor, otherwise the sponsor would probably take the position. Consequently, on initial entry the son who acts on network information would move to a position that, in prestige terms, is equal to or less than the one held by the sponsor.

Once a son enters a position he may move to another on the basis of newly available information. The first job held, however, has a significant influence on further mobility (Blau and Duncan, 1967). Consequently, the final occupation obtained by the son is likely to be one which is approximately equal to or less than his father's in terms of prestige. This would lead to a perpetuation of the patterns of inequality that exist within the society. Another possible result of this pattern might be that some sons who remained within their fathers' situs would remain in jobs with less prestige than their fathers' positions. The result of this loss of prestige between generations would mean that by utilizing social resources for the placement of sons, fathers' might actually be decreasing the mobility potential of their sons. If the son's final prestige was lower than his father's, then for that family there is an increase in inequality, the son "falling" to a lower prestige position.

Section III - A Critique of Methods

What problems are there in addressing the question of the existence of situs through the data and methods used in this study? And what might be a better approach here are the two questions explored in this section. Problems with the methodology and data used in this project are discussed first, followed by a brief exploration of a better plan for determining the existence and influence of situs.

The methods used in this study for examining the concept of situs can be divided into three parts: 1) the data base (Chapter One); 2) the determination of network connections through career linkages (Chapter Five) and; 3) the analysis of situs groups (Chapters Seven and Eight). Each of these is explored and critiqued in turn.

The data used in this project came from manuscript schedules of the United States Census and from city directories, all from the city of Portsmouth, New Hampshire. The entire male population reported in either of these sources at five-year intervals was recorded with name and occupation (SIOP minor group) included at all points. Age, relation to head of household, and family number were also used when available from the census data. Name, and in some cases age, were used to trace individual men over time.

Names caused a major problem in this project for several reasons. Misspellings, nicknames, and other problems directly related to the collectors of the original material have been discussed in Chapter One. In some cases these problems undoubtedly led to incorrect tracing between men, where the same name appears exactly the same at two time points, it does not in all cases refer to the same person. This was evident in the traces of some men from some occupational code to one of the child codes. Although this was not a serious problem, it does tend to introduce some noise into the tracing.

Another problem with using name as a tracing variable was that this procedure excluded any possibility of including females in the analysis. The role of women in the labor force of Portsmouth was not a major one, although an examination of a list of reported female occupations (see Appendix X) indicates that their impact increased over time. Females, it seems, were found in only a few segments of the occupational structure - sales, service, and unskilled labor. In any event, the exclusicn cf women from this analysis presents a one-sided picture of the composition of the labor force.

Occupational information was another problem area in the data. The data were collected, in the two sources, for two different purposes (Chapter One). This problem was especially evident in the intergenerational trace set for 1870 to 1890, the later year being a directory (see Chapters Seven and Eight). Beside this difficulty coding scheme used, Treiman's SIOP (1977a), may also be criticized.

Although Treiman (1977a) presents a theoretical rationale fcr the used of the SICP with data from any society at any time (see Chapter One), the level of the data base here is the community. This leads to several problems. First of all, there is nc differentiation available in the scale at the minor group level to distinguish between owners and workers in mcst of the manual sector (codes 070 to 099). For example, an independent blacksmith is given the same prestige as one who wcrks in a large factory. Additionally, the size of the establishment owned by a working proprietcr is not differentiated, hence the owner cf a peanut stand and the owner of a lumber and coal yard are given the same prestige score. Consecuently the range of actual prestige in the community is only crudely mirrored by the SIOP scale.

A further problem with the data is that they were collected at five-year intervals. This procedure was necessary because cf the availability of data and the time span with which the study is concerned. However, as the discussion in Chapters Three and Four makes clear, the situs movement which is the concern of this project is frequently short-lived. This means that the data, while adequate at a general level, miss many connections that are assumed to exist.

There is yet another problem in using two different sources of data, census and directory, for the analysis. Chapter One notes how names and occupations differed between these two bases. An elaborate correction procedure was required to change the reported names so that a sufficient number of traces could be obtained. This procedure undoubtably resulted in connections between names which were not of the same person.

Finally, the sample used to test the situs approach is not representative of any population except that of men who remained in Portsmouth for a twenty-year period and whose fathers lived in the community at the beginning of that period. This poses serious problems in trying to extend the findings to the general population. However, since the aim of the project was to explore the concept of situs to determine whether or not it is a fruitful approach to pursue, the non-representativeness of the sample is viewed as the price that must be paid to allow the approach to be tested.

Given the problems with the data, Chapter Five was concerned with tracing men among each pair of the five-year intervals. The occupations so connected were used to determine the probable network connections that existed within the labor market. This procedure, of course, is only as good as the data. Once the number of moves between occupations was determined, the proportionate movement between occupations, called the linkage index, was calculated for each occupation reported.

An effective connection between occupations was assumed to exist if one man in 28 moved between the two connected occupations. There is no way to determine if this documents an effective connection. Based on the assumptions presented in Chapter Five, this would be the case, but there is no way to validate the assumptions.

Finally, the linkage procedure overwhelms those occupations with a small number of incumbents when they are connected to any occupation with a large number of incumbents. Consequently, many connections that may have been effective are masked. This means that only a portion of those network connections assumed to be effective are reported.

The analysis of situs presented in Chapters Seven and Eight also contains some difficulties. In light of the problems discussed above the techniques used in the analysis are adequate because they have the fewest assumptions of any of the appropriate hypothesis-testing procedures. But even here some difficulties should be addressed.

Noise seems to be a major feature of the analysis section. Even with the significance levels achieved, much of the connection between fathers' and sons' occupations must be considered random movement because of the data problems. It is interesting to note that the situs idea was supported even with these problems.

The removal of the influence of capital inheritance (Chapter Eight) also poses a problem. As discussed, the occupations chosen were ones which could be assumed to involve some capital. Without an extensive search of the records, however, this list is simply guess-work. In effect, the removal of capital inheritance piles one assumption on top of a group of others, making the results conform to the theory rather than viewing this as potential verification of the hypotheses. Although the arguments given seem to be logical and follow the spirit of the theory, they were not articulated prior to their inseption, and could be faulted on these grounds.

Most of the data problems, and many of the analytic difficulties, could be overcome in a contemporary study. To address the same questions addressed here, a study of situs operations in the current labor market would focus primarily on three areas. These are:

a) A determination of the network connections that exist within the occupation of the father.
b) A determination of where the information the son acted on in acquiring his first occupation came from.
c) The credential requirements (and prestige) of both the fathers' and sons' occupations.

All of this information could be collected through interviews of a sample of new entrants into the labor force. Ideally they should be examined during the first year of their first full-time employment because the memory of who gave them the information would be fresh and the network connections to the fathers' occupations should not have drastically changed.

A random sample of men (women should be included in this sample, but the discussion throughout this project has focused on men) aged 15 to 25 might be undertaken. All those who were either not in a full time job, or who had been in a job for over one year, would be excluded. This age range was chosen because the preponderance of initial labor force entrants fall into it.

Once the sample is collected both the son and his father could be interviewed (for the sake of discussion, it is assumed here is that all sons will have a living father). Fathers would be asked to identify occupations, if any, their workmates were in prior to their present position, and to identify occupational groups with which they interact in the course of their work. Information could also be collected on the occupation of neighbors, friends, and relatives, but it would be coded as available occupations not within the fathers' situs. The occupation of the father, and its credential requirements, would also be ascertained.

Sons would be asked to identify how and from where they first heard about their present positions. There might also be questions dealing with what other sources were tried, why they acted on the information that guided them to their present position, and what new information was now available to them. Their present occupation, and its credential requirements, would also be ascertained.

With this type of information, the situs concept could be more directly addressed than with the historical data used here. By directly determining the fathers' situs any influence it might have on the sons would be apparent from the answers given by the son. Whether occupational situs has an influence or not could be determined, and the general effect of network contacts could be examined. Additionally, by directly determining credential requirements, the hypothesis that these serve as barriers to situs movement could be explored.

The determination of the influence of situs in the current labor market would be relatively easy to undertake. In the next section, how the situs concept might alter the basic conceptualization of the occupational structure, and some consequent policy implications are explored.

Section IV - Conceptualization and Policy

Stratification research can be seen to rest on a broad conceptual base comprising the most valid element of analysis and the major dimensions of concern. There is basic agreement within the field that the basic unit of analysis in stratification should be the family (Parkin, 1971) and the basic dimensions of the field are economic (wealth and income), political (power), and social prestige or status (Vanfossen, 1979). Additionally, in addressing mobility, Sorokin (1959) points out that intergenerational movement within these dimensions can either be vertical (increase or decrease on one or more dimensions) or horizontal (movement within and among dimensions at the same level). Since this conceptualization forms the backbone of stratification theory, it is important to note where situs fits in.

The concept of situs and network connections does not detract from this conceptualization. Rather, such connections help explain how the movement among the various dimensions occurs.

As presented in this project, situs is best seen as a mechanism that contributes to horizontal movement among economic positions. The movement itself is based on information available to the father (family) from his position within the occupational structure. As noted earlier, a man's position within this structure results in a limited range of information, usually restricted to positions similar to his own. Information and its availability are seen as a force that channels movement between positions from one generation to another.

With the specification of the mechanism of transfer the basic model becomes dynamic. New members must be recruited into each dimension for it to perpetuate itself. The people who fill the various positions within these hierarchies must accept the new members into the hierarchy, and this acceptance is at least partially on the basis of ascriptive criteria. These criteria are usually based on family membership and the behaviors, attitudes, and values learned within this environment. However, a more immediate criterion for acceptance into an existing structure is that the person must somehow signal his desire to enter the structure. This is where occupational networks come into play.

The three dimensions of stratification are tied together, both internally and to each other, by networks. Movement within each may occur under normal circumstances only when a person knows that movement is possible. Within this framework placement within a network is basically more important than either ability or training. Without information, a person cannot move to a new (better) position within any structure.

This leads to a slightly different picture of the stratification process. The family is still very important for training, socialization, and so on, but the family's location within a series of networks is seen as the dominant criterion for transferring advantace (or disadvantage) to its children. Consequently, the three major dimensions of stratification, static in themselves, are seen as being structured and perpetuated by network connections. The family is still important, but a more important factor is the group within which the family exists.

This slight modification of the conceptualization of stratification has some policy implications.

In the United States equality of opportunity is regarded as one of the fundamental rights of all citizens. An awareness of unequal opportunity for a number of groups in this country has led to the adoption of programs by the federal government that try to equalize opportunity, or at least to remove the major impediments experienced by large groups of people. These programs are basically of two kinds. One type consists of programs to equalize human capital, usually education, but also attitudes and skills relevant to employment. The second type of program pertains to employment discrimination (affirmative action) (Turner and Kluegel, 1981).

The concern here is for the first type of program, that which attempts to raise the skill or educational level of individuals. As has been discussed, raising the skills of an individual will have little influence on that person's mobility potential by itself. Of more importance is the information available to that individual about vacancies. Consequently, job training and placement in isolated work environments (i.e., job corps and CETA) will only temporarily assist an individual. Over time, unless contacts are developed within the situs of the occupation, the trained individual will find himself with skills but with nowhere to practice them.

This, of course, is not always the case. The studies on network connections and employment (Chapter Three) show that around 40% of jobs are found through formal channels and employment agencies. However, there remain the 60% of workers who find their positions through network contacts. Without being placed within one of these networks where job contacts are available, the worker trained through federal programs remains at a disadvantage. "The major deficiency in these (federal) efforts is that they tend to ignore the structure of economic inequality, as well as the cultural conditions supporting this inequality (Turner and Kluegel, 1981:245)."

There seems little point in increasing the size or scope of formal mechanisms (federal employment agencies and the like), for these have been only moderately successful in placing people in positions (Peterson, 1980). The idea of network contacts indicates that the long-term impact of job-training programs could be improved somewhat by several expedients. First of all, people within these programs should be introduced into occupational networks. These networks must be enduring ones, else once a job is left (for whatever reason) no information about similar positions will find its way to the worker. A plan to develop these networks would be to physically relocate the worker. Introduced into a new environment, he is likely to develop friendship ties at the workplace that would carry outside the work environment, and consequently allow for the flow of vacancy information.

Secondly, if one of these trainees does lose his job, income maintainance should be provided until a new position is acquired. If not, the worker would likely contact members of his current network - who would be generally unskilled - to find employment. Since this type of employment would be of a type that is poorly rewarded, the same conditions that existed prior to training would again exist.

Finally, a better approach to the whole idea of equalizing human capital would be to equalize housing patterns. Since network information about position vacancies can come from sources other than occupational ones, notably from neighbors (Chapter Three), integrated housing patterns would provide a larger pool of possible contacts. Discrimination based on real or imagined differences would all serve as barriers to this type of information sharing, but within a mixed-class neighborhood, there would at least be the possibility that information transfer might take place.

In sum, current policies that attempt to decrease inequality are short-range and have little long-lasting effect. Situs and network contacts, as the immediate connection between people and positions, indicate one area where they are deficient. There are many other areas where these programs have problems (Gans, 1974; Anderson, 1974) but they are criticized here only from the perspective of networks.

Epilogue

This dissertation has explored the influence of networks on occupational mobility using the concept of situs, or location within the occupational structure defined by network connections. Some of its ramifications for individuals, social theory, and social policy have been examined.

The findings and discussions presented indicate that situs is a useful concept and needs further exploration. By determining the interlocking networks within a labor market, the "why" of intergenerational mobility can be understood more fully.

Clearly this project has not resolved the situs issue. It has, rather, pointed out its possible influence and effects. With further research into this area stratification theory can be improved for the inclusion of empirically demonstrable interacting groups in such examinations is obviously indispensable. After all, groups are really the basic and most important force in all of social life.

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APPENDIX

Appendix I
SIOP Major Group Code Specifications
(Treiman, 1977a:235 - 260)

Code	Prestige	Occupational Title
0	58	Professional, technical, and related workers (high professionals)
1	58	Professional, technical, and related workers (low professionals)
2	64	Administrative and managerial workers
3	41	Clerical and related workers
4	40	Sales workers
5	27	Service workers
6	34	Agricultural and related workers
7	32	Production and related workers (workers in manufacturing)
8	32	Production and related workers (craft and skilled workers)
9	32	Production and related workers (semi- and unskilled workers and transportation operatives)
10	42	Military
11	32	New workers seeking employment
12	40	Unclassifiable
13	41	Not in labor force
22	--	Too young for school
33	--	In-school
99	--	Missing

Appendix II
Minor Group Code and Specification
(Treiman, 1977a:235 - 260)
(Part One of Two)

Code	Prestige	Occupational Title
002	69	Engineers and architects
003	57	Surveyors and draftsmen
004	55	Ship's officers
006	68	Medical workers, pharmacists and veternaries
007	52	Other medical workers
011	62	Accountants
012	75	Jurists
013	61	Teachers
014	54	Minister
015	56	Journalists
016	52	Artists
017	45	Musicans
018	49	Atheletes
019	54	Librarians
020	65	Administrative officials
021	63	Managers
030	55	Clerical supervisors
031	55	Government executive officials
033	38	Bookkeepers
035	57	Transportation and communication supervisors
036	32	Transport conductors
037	30	Distribution clerks
038	44	Telegraph operators
039	35	Clerks not elsewhere classified
040	45	Retail managers
041	48	Working proprietors (retail and wholesale)
042	46	Buyers
043	46	Salesmen
044	48	Auctioneers and real estate salesmen
045	28	Shop assistants and street vendors
049	15	Salesmen not elsewhere classified
050	40	Managers (catering and lodging)
051	37	Working proprietors (catering and lodging)
052	37	Housekeeping and related workers
053	26	Cooks and waiters
054	22	Servants
055	25	Building caretakers
056	22	Launderers
057	32	Barbers
058	35	Protective service workers
059	32	Service workers not elsewhere classified

Appendix II
Mincr Group Code and Specification
(Part Two of Two)

Code	Prestige	Occupational Title
060	48	Farm formen
061	40	Farmers
062	20	Farm laborers
064	32	Fishermen and related workers
070	46	Production supervisors
072	35	Metal processors
073	30	Sawyers
075	29	Spinners, weavers, and related workers
076	22	Leather workers
077	34	Food and beverage processors
078	28	Cigar makers
079	34	Tailors, upholsterers, sailmakers and related
080	26	Shoe and leather goods makers
081	36	Cabinetmakers and related workers
082	38	Stone cutters
083	36	Blacksmiths, toolmakers and related workers
084	41	Machine fitters and related workers
085	39	Electrical and related workers
087	37	Plumbers, welders and related workers
088	43	Jewellers
092	41	Printers and related workers
093	30	Painters
094	33	Music tuners or makers
095	31	Carpenters and other construction workers
096	38	Stationary engineers and related workers
097	26	Material handlers and riggers
098	29	Transportation equipment operators
099	32	Manual workers not elsewhere classified
100	42	Military
110	32	Students
120	40	Unclassifiable
130	41	Not in labor force
222	--	Too young for school
333	--	In school
999	--	Missing or not known

Appendix III
Unit Group SIOP Code Specifications
(Treiman, 1977a:235 - 260)
Professional, Administrative, and Managerial Codes
(Part One of Six)

Code	Prestige	Occupational Title
11	69	Chemist
21	72	Architect
22	70	Civil engineer
23	65	Electrical engineer
24	66	Mechanical engineer
29	55	Engineer not elsewhere classified
31	58	Surveyor
32	55	Draftsman
42	50	Ship's deck officer
43	60	Ship's engineer
52	68	Bacteriologist
54	52	Medical inspector
61	78	Medical doctor
62	50	Medical assistant
63	70	Dentist
64	44	Assistant dentist
65	61	Veternarian
67	64	Pharamcist
72	44	Nurse not elsewhere classified
75	60	Optometrist
79	50	Chiropodist
110	62	Accountant
121	73	Lawyer
122	76	Judge
129	71	Juror
131	78	University Professor
132	60	Teacher
134	49	Assistant teacher
139	62	Teacher not elsewhere classified
141	54	Minister
151	62	Author
159	56	Journalist
161	57	Artist
162	49	Commercial artist
163	46	Photographer
171	45	Musician
172	40	Dancing teacher
173	57	Actor
180	49	Athlete
191	54	Librarian
201	63	Mayor
202	64	Member of congress
203	66	High administrative official
211	65	General manager
219	60	Manager not elsewhere classified

Appendix III
Unit Group SIOP Code Specification
Clerical, Sales, and Service Codes
(Part Two of Six)

Code	Prestige	Occupational Title
300	55	Clerical supervisor
310	55	Government executive official
321	48	Stenographer
331	41	Bookkeeper or cashier
339	34	Bookkeeper not elsewhere classified
351	56	Railway station master
352	58	Post master
359	37	Dispatcher
360	32	Transport conductor
370	30	Distribution clerk
380	44	Telegraph operator
391	30	Stock clerk
393	44	Office clerk
394	34	Travel agent
399	37	Clerk not elsewhere classified
400	45	Manager, retail and wholesale
410	48	Working proprietor, retail and wholesale
422	46	Buyer
431	46	Technical salesman
432	47	Commercial traveler
441	50	Real estate agent
442	42	Advertising salesman
443	45	Auctioneer
451	32	Shop assistant
452	24	Street vendor
490	15	Salesman not elsewhere classified
500	40	Manager, catering and lodging
510	37	Working proprietor, catering and lodging
520	37	Housekeeping and related worker
531	31	Cook
532	21	Waiter
540	22	Servant
551	25	Building caretaker
552	20	Cleaner
560	22	Launderer
570	32	Barber
581	35	Fireman
582	40	Policeman
589	30	Protective service worker not elsewhere classified
591	29	Guide
592	34	Undertaker

Appendix III
Unit Group SIOP Code Specifications
Agricultural and Manufacturing Codes
(Part Three of Six)

Code	Prestige	Occupational Title
599	29	Other service worker
600	48	Farm foreman
611	40	Farmer
612	55	Specialized farmer
621	20	Farm laborer
624	26	Livestock worker
627	21	Gardener
629	14	Agricultural worker not elsewhere classified
631	18	Logger
641	32	Fisherman
700	46	Production supervisor
711	34	Miner
721	45	Steel worker
723	38	Melter
724	33	Casting founder
725	38	Moulder
728	28	Iron plater
729	38	Metal processor not elsewhere classified
731	29	Wood treater
732	30	Sawyer
749	30	Polish maker
752	34	Spinner
753	30	Carder
754	32	Weaver
756	25	Dyer
759	26	Textile worker not elsewhere classified
761	22	Tanner
762	22	Dresser
771	33	Miller
772	45	Candy maker
773	24	Butcher
776	33	Baker
778	34	Brewer
779	34	Food processor not elsewhere classified
782	28	Cigar maker
791	40	Tailor
793	32	Milliner
794	41	Pattern maker
796	31	Upholsterer
799	34	Sailmaker

Appendix III
Unit Group SIOP Code Specifications
Craft and Skilled Worker Codes
(Part Four of Six)

Code	Prestige	Occupational Title
801	28	Shoemaker
802	28	Shoe cutter and related worker
803	22	Leather goods maker
811	40	Cabinet maker
819	31	Wood worker not elsewhere classified
820	38	Stone cutter
831	35	Blacksmith
832	40	Tool maker
833	38	Machine tool setter
834	38	Machine tool operator
835	27	Metal polisher
839	40	Locksmith
841	42	Machinist
842	47	Watchmaker
843	44	Motor vehicle mechanics
849	30	Machinery fitter not elsewhere classified
851	38	Electrical fitter
855	44	Electrician
856	35	Telephone inspector
857	36	Electrical linesman
859	40	Electrical not elsewhere classified
871	34	Plumber
873	34	Sheet metal worker
874	44	Structural metal preparer
880	43	Jeweler
892	25	Potter

Appendix III
Unit Group SIOP Code Specifications
Semi- and Unskilled Worker and Transportation Codes
(Part Five of Six)

901	30	Rubber manufacturer
921	42	Printer
922	41	Pressman
923	41	Type setter
924	41	Engraver
926	32	Book binder
927	36	Photograph printer
929	41	Printer not elsewhere classified
931	31	Painter
939	29	Painter not elsewhere classified
941	33	Music tuner or maker
942	21	Basket maker
949	41	Taxidermist
951	34	Mason
952	34	Cementer
954	37	Carpenter
955	31	Caulker
957	26	Glazier
959	28	Construction worker not elsewhere classified
961	42	Gas maker
969	34	Stationary engineer
971	20	Freight handler
972	32	Rigger
973	32	Drawbridge tender
981	29	Ship deck rating
983	34	Railway engine driver
984	29	Railway brakeman and related
985	31	Vehicle driver
989	24	Transport operator not elsewhere classified
995	46	Skilled worker not elsewhere classified
997	33	Semi-skilled worker not elsewhere classified
999	18	Laborer not elsewhere classified

Appendix III
Unit Group SIOP Code Specifications
Miscellanecus Codes
(Part Six of Six)

1000	42	Military
1100	32	Student
1200	40	Unclassifiable
1300	41	Not in labor force
2222	--	Too young for school
3333	--	In school
9999	--	Missing or not known

Appendix IV
Age Group Composition - Males
Portsmouth, New Hampshire 1850 - 1910

Year

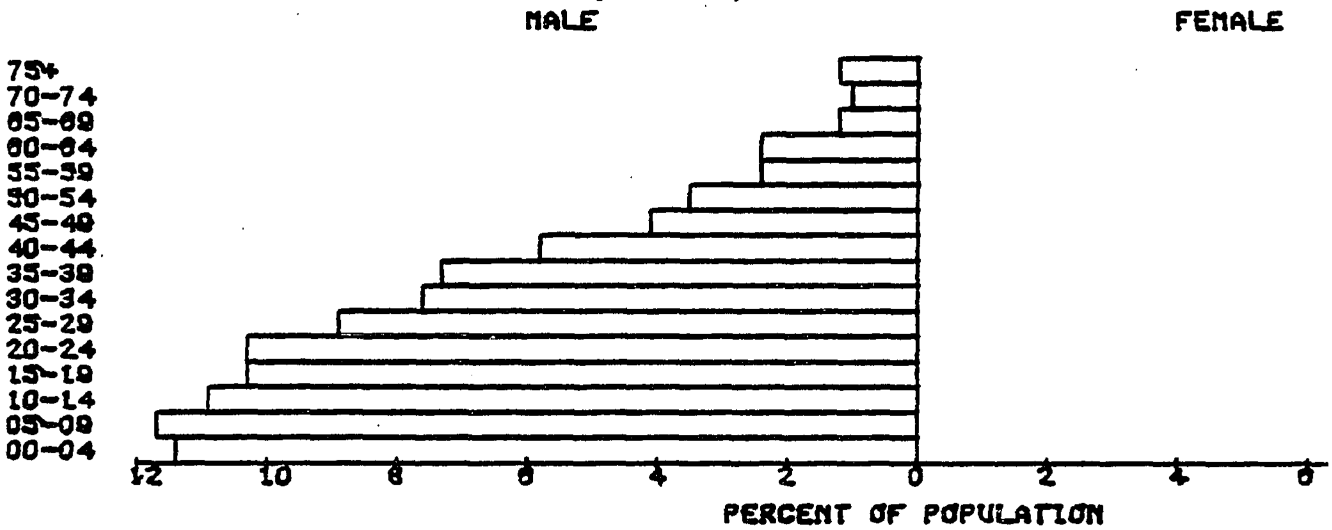
Age Group	1850	1856	1860	1864	1870	1875	1880	1886	1890	1895	1900	1905	1910
00-04	516	520	527	650	445	432	418	406	398	400	404	416	429
05-09	528	515	510	607	388	407	428	408	393	388	384	395	407
10-14	492	463	449	600	466	457	447	405	378	354	329	339	349
15-19	462	435	422	540	394	380	364	344	331	325	319	328	338
20-24	466	383	335	429	313	360	410	405	402	411	422	435	448
25-29	399	357	334	458	370	364	358	390	413	455	503	518	534
30-34	341	311	294	407	332	314	294	353	393	457	529	545	561
35-39	328	300	284	387	310	329	350	363	373	398	426	439	452
40-44	262	245	237	325	263	290	319	320	322	334	349	359	370
45-49	186	217	238	298	210	241	275	270	267	271	277	285	294
50-54	156	177	190	251	192	206	220	213	209	210	212	218	225
55-59	107	113	118	183	170	166	162	179	191	212	236	243	250
60-64	107	107	107	152	128	135	143	149	154	165	177	182	187
65-69	52	61	67	109	106	114	123	128	132	142	151	159	169
70-74	44	51	54	71	54	77	102	98	95	94	94	96	99
75+	56	49	45	64	55	66	77	81	84	90	97	100	103
Missing	5	0	1	1	2	1	0	3	4	8	16	0	0
Tot.	4507	4304	4212	5532	4198	4339	4490	4514	4539	4714	4925	5057	5215

Census reports in 50, 60, 70, 80, and 1900
Estimated Reports otherwise

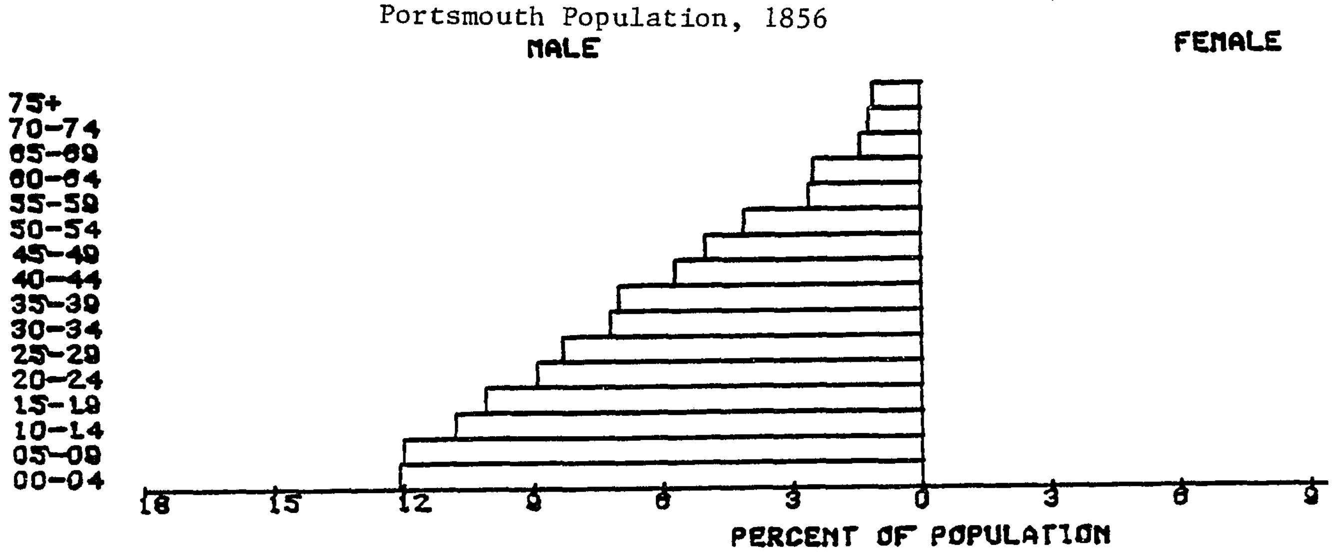
Estimated reports may be off by as much as .5% due to rounding. Missing reports are of those men who had no age reported in the census, or, for estimated years, the number of cases needed to bring the column sum to the total figure for that year.

Appendix V
Population Pyramids
(Part One of Seven)

Portsmouth Population, 1850

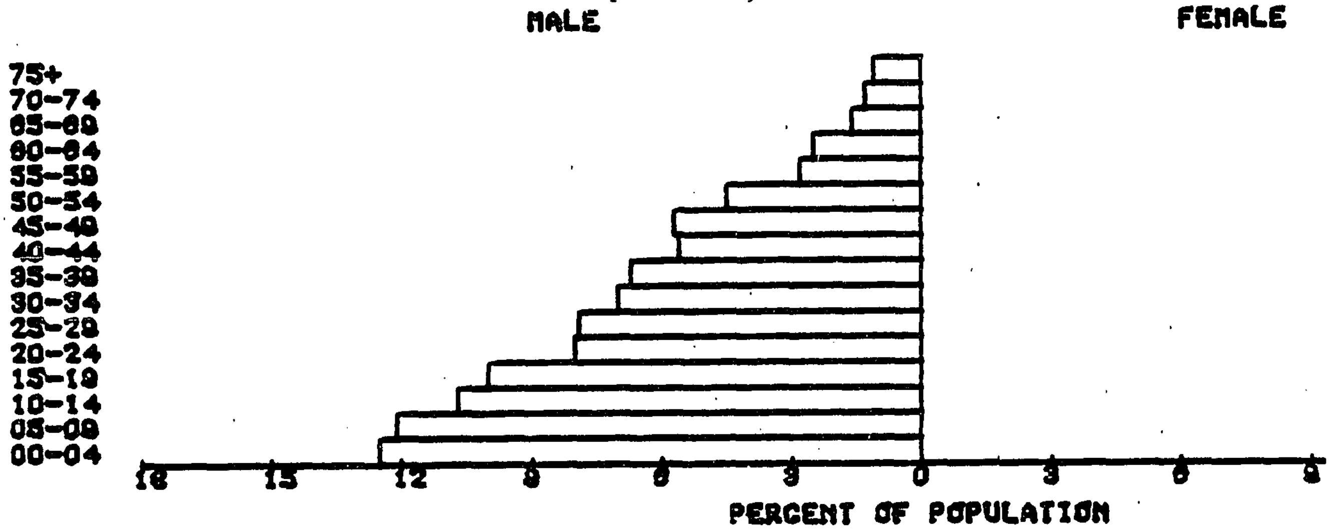


Portsmouth Population, 1856

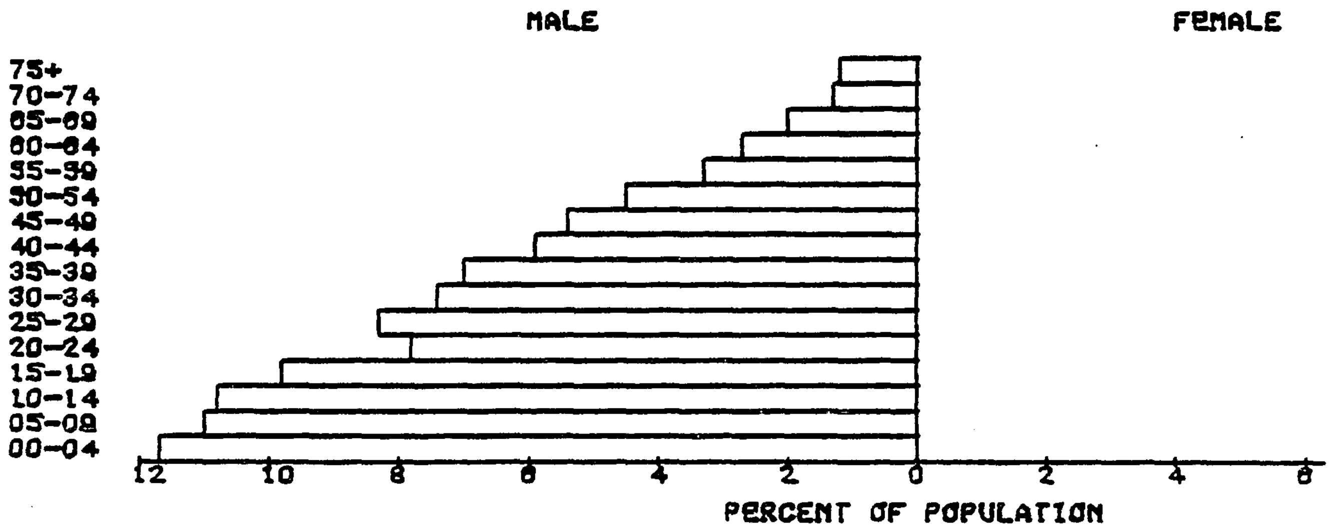


Appendix V
Population Pyramids
(Part Two of Seven)

Portsmouth Population, 1860

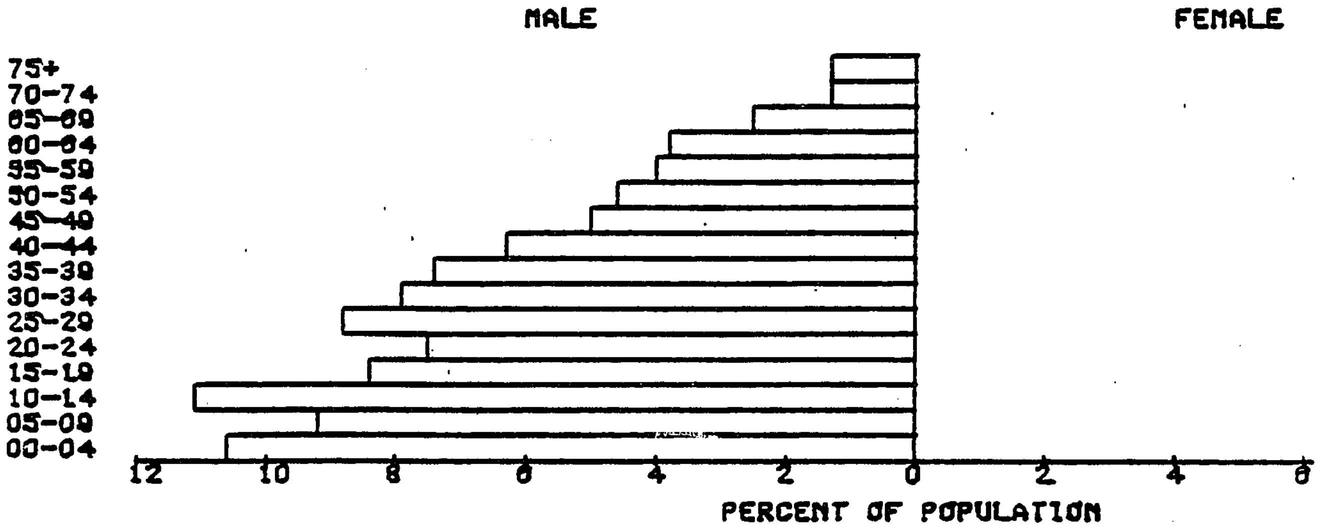


Portsmouth Population, 1864

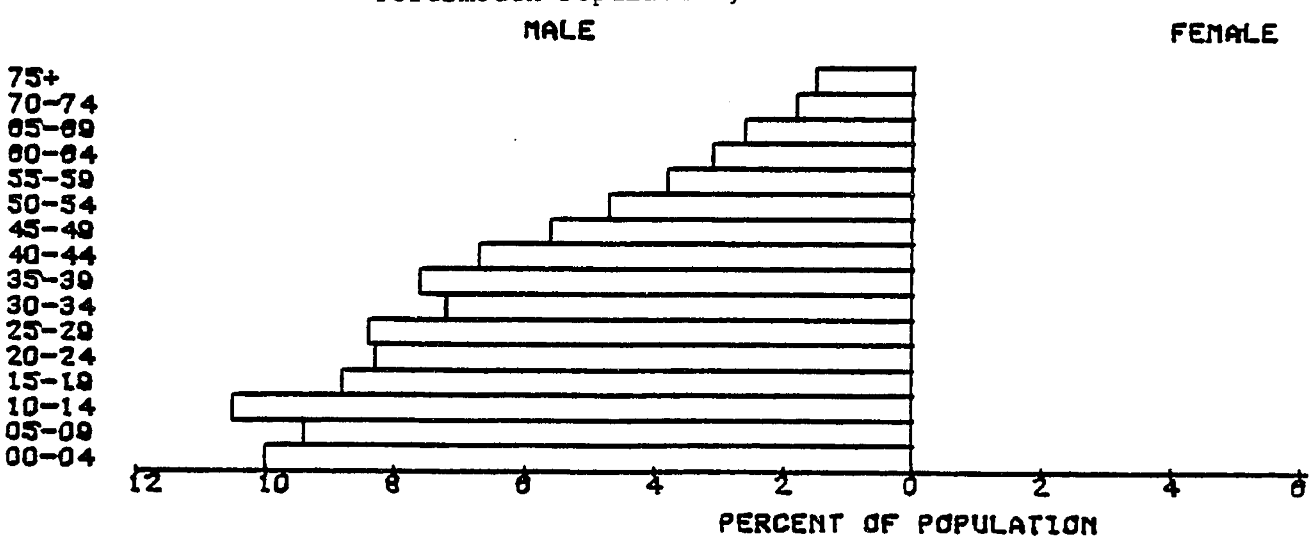


Appendix V
Population Pyramids
(Part Three of Seven)

Portsmouth Population, 1870

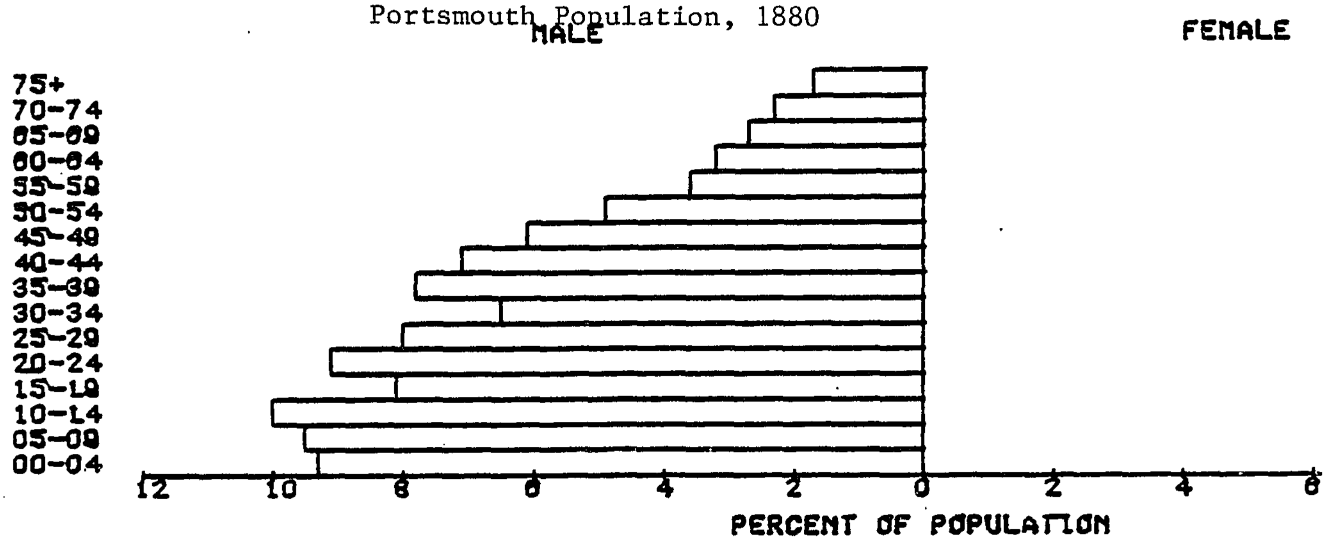


Portsmouth Population, 1875

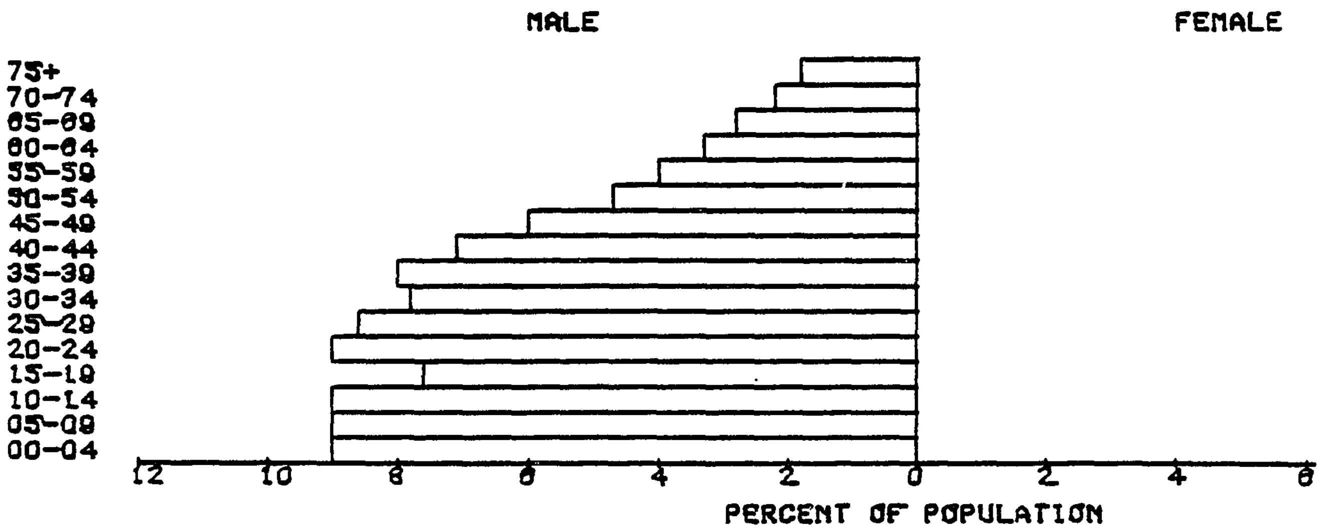


Appendix V
Population Pyramids
(Part Four of Seven)

Portsmouth Population, 1880

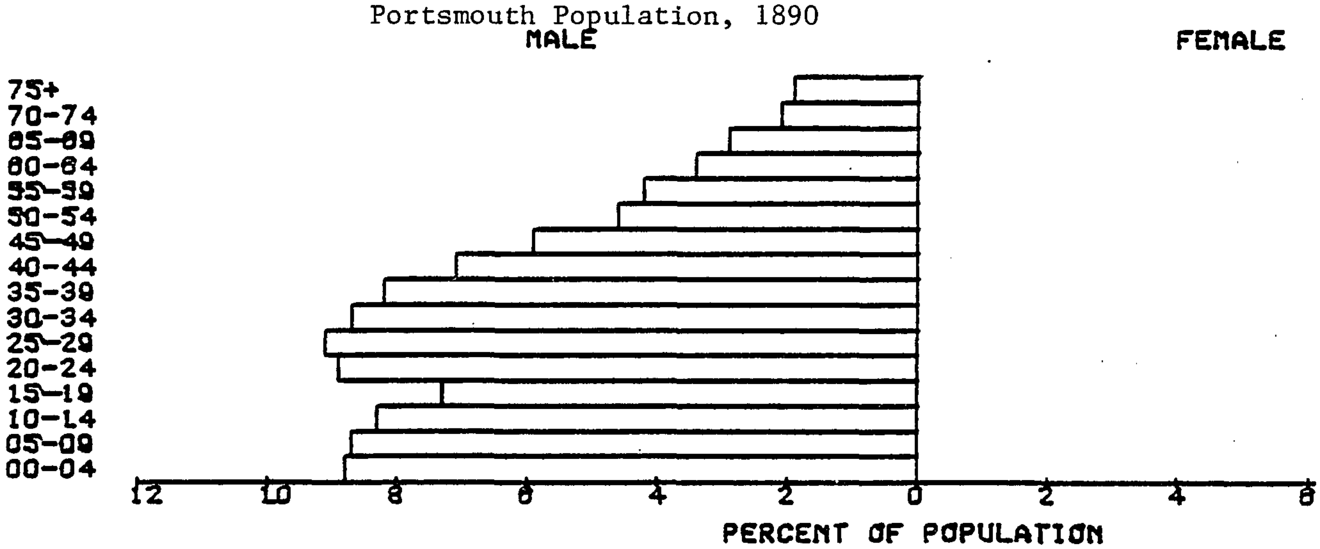


Portsmouth Population, 1886

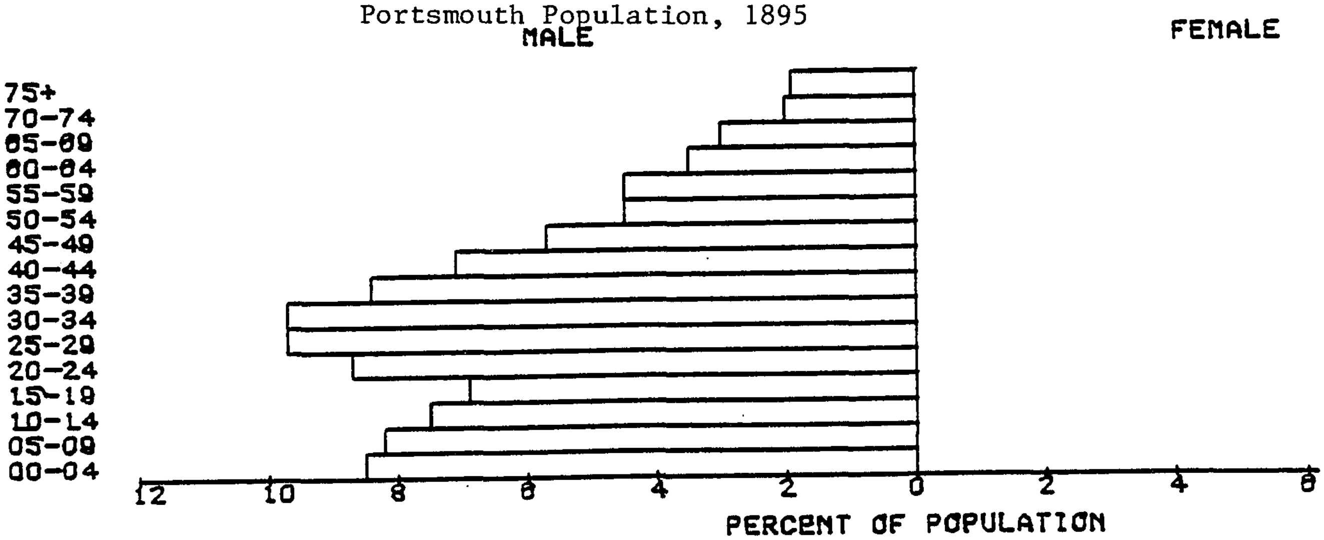


Appendix V
Population Pyramids
(Part Five of Seven)

Portsmouth Population, 1890

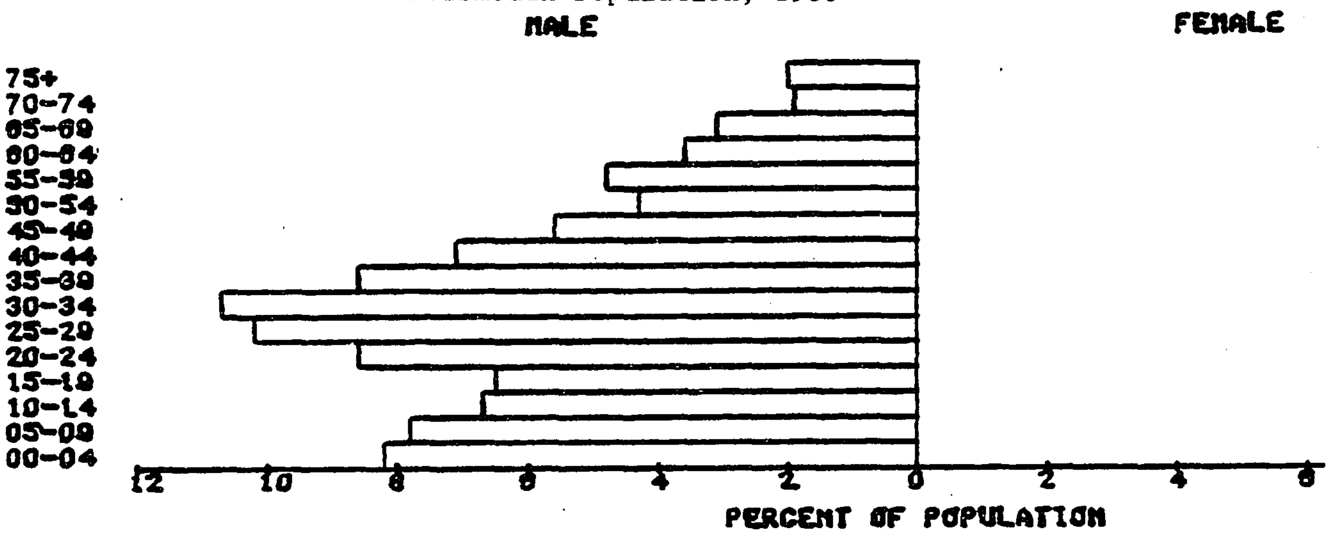


Portsmouth Population, 1895

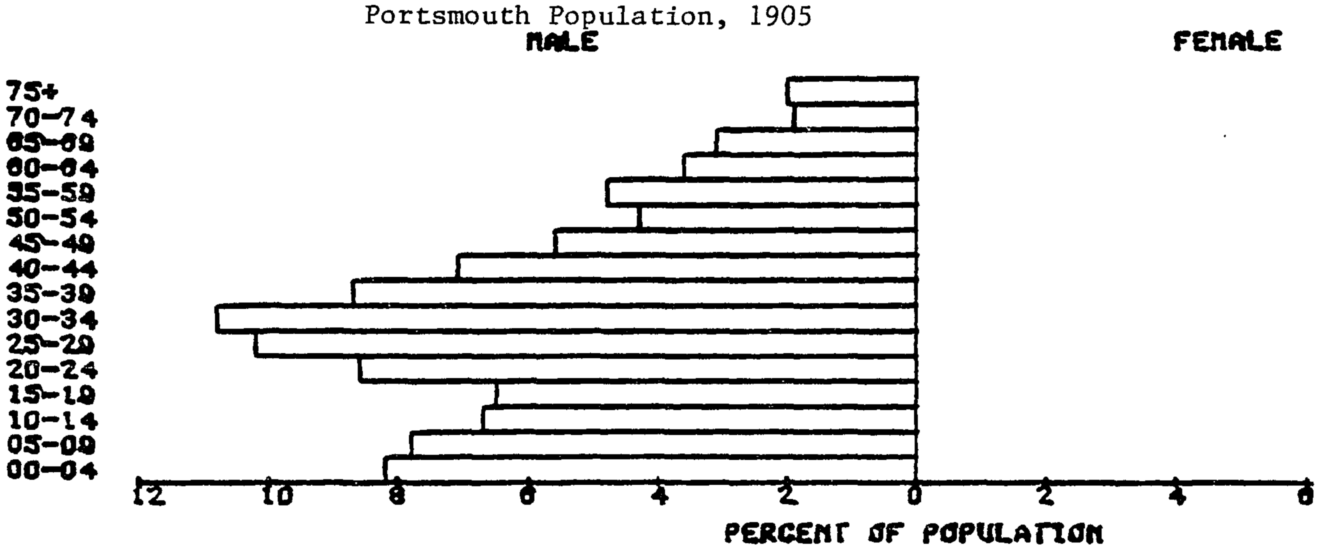


Appendix V
Population Pyramids
(Part Six of Seven)

Portsmouth Population, 1900

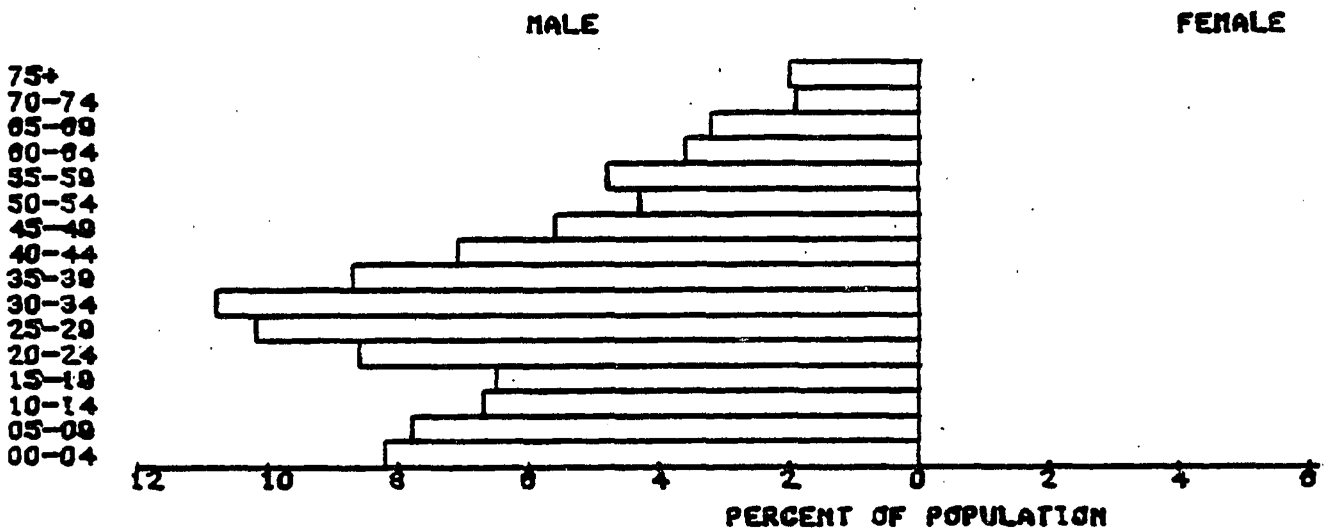


Portsmouth Population, 1905



Appendix V
Population Pyramids
(Part Seven of Seven)

Portsmouth Population, 1910



Appendix VI
Combined Life Table
Males
All Available Data
1864 to 1900

Age	Pop	Dea	5Qx	Lx	5Dx	5Lx	Tx	Ex	Adj
00-04	3553	151	0.191	100000	19136	452161	4415040	44.1	----
05-09	3403	27	0.039	80864	3141	396469	3962880	49.0	.085
10-14	3436	17	0.025	77723	1902	383861	3566410	45.9	.033
15-19	2997	22	0.036	75821	2734	372272	3182550	42.0	.042
20-24	3152	42	0.064	73088	4708	353668	2810280	38.5	.047
25-29	3311	28	0.041	68380	2823	334840	2456610	35.9	.053
30-34	3079	33	0.052	65556	3420	319231	2121770	32.4	.052
35-39	2936	37	0.061	62136	3794	301194	1802540	29.0	.060
40-44	2522	34	0.065	58342	3800	282208	1501340	25.7	.064
45-49	2109	29	0.066	54542	3619	263662	1219130	22.4	.081
50-54	1713	40	0.110	50923	5614	240579	955472	18.8	.092
55-59	1499	31	0.099	45309	4483	215335	714893	15.8	.127
60-64	1203	45	0.171	40825	6993	186644	499558	12.2	.161
65-69	1005	48	0.214	33832	7243	151052	312914	9.3	.223
70-74	685	45	0.283	26589	7511	114167	161861	6.1	.500
75+	614	107	1.000	19078	19078	47695	47695	2.5	----

Age - Age Interval
Pop - Total (census and estimated) population in that age group from 1864 to 1900
Dea - Total reported deaths in the age interval for the data years
5Qx - Proportion dying during the interval (see Barclay, 1958: 114)
Lx - (Radix) Number living at the beginning of the interval
5Dx - (Radix) Number dying during the interval
5Lx - (Radix) Number alive in the interval
Tx - (Radix) Number of person years in this and all subsequent intervals
Ex - Mean life expectancy (years) for the midpoint of that interval
Adj - Three point moving average of 5Qx
(see Barclay (1958: Chapter 4) for complete information on life table construction)

Appendix VII
Composition of SICP Major Group Categories
By Year
Raw Numbers

	Year												
Code	1850	1856	1860	1864	1870	1875	1880	1886	1890	1895	1900	1905	1910
0	108	91	57	82	49	72	69	68	64	71	74	135	114
1	50	49	67	63	68	60	60	49	52	64	77	79	89
2	94	49	59	49	12	38	18	46	44	36	15	25	32
3	174	84	67	174	100	226	147	314	358	368	194	509	515
4	109	203	295	225	396	250	388	243	280	302	399	362	369
5	28	44	80	74	70	124	157	147	197	207	257	214	237
6	229	141	240	169	202	166	344	273	244	230	275	139	129
7	307	230	260	226	249	157	216	149	219	190	192	197	191
8	307	209	271	288	258	305	261	358	824	625	646	544	551
9	1181	786	962	1108	1162	863	1261	1033	1123	1160	1331	1271	1120
Othr	1920	92	1854	338	1632	235	1569	217	258	273	1465	316	324
Tot>	4507	1978	4212	2796	4198	2496	4490	2897	3663	3526	4925	3791	3671

See Appendix I for code explanation.
Other category includes major group codes 10, 11, 12, 13, 22, 33, and 99.

Appendix VIII
Minor Group Composition By Year
Raw Numbers
(Part One of Three)
(White Collar Occupations)

Code	Year												
	1850	1856	1860	1864	1870	1875	1880	1886	1890	1895	1900	1905	1910
002	19	17	8	12	8	21	23	23	21	24	18	70	53
003	2	0	2	1	1	3	4	4	1	1	7	13	6
004	56	49	22	45	16	18	11	13	7	6	7	4	0
006	31	25	25	24	24	30	31	26	34	38	40	42	51
007	0	0	0	0	0	0	0	2	1	2	2	6	4
011	0	4	10	12	0	6	4	2	1	1	0	1	1
012	16	14	24	14	16	11	13	14	17	13	11	18	20
013	14	13	11	11	12	8	14	6	6	6	5	8	4
014	8	10	12	15	13	8	10	10	10	15	19	18	19
015	1	2	1	0	0	4	9	4	6	11	13	11	9
016	3	4	5	7	6	5	5	8	4	10	14	7	7
017	7	2	3	3	21	18	5	5	7	7	13	14	28
018	0	0	0	0	0	0	0	0	1	1	1	1	1
019	1	0	1	1	0	0	0	0	0	0	1	1	0
020	2	0	0	1	2	0	1	1	3	1	2	4	1
021	92	49	59	48	10	38	17	45	41	35	13	21	31
030	0	0	0	0	0	0	0	2	8	3	2	1	1
031	10	15	6	11	12	13	16	13	22	15	9	20	22
032	0	0	0	0	0	0	1	0	1	3	2	9	11
033	7	7	12	10	24	21	29	30	38	46	66	52	59
035	8	6	3	8	5	5	5	11	13	10	12	13	12
036	3	4	6	5	5	5	9	7	6	9	24	24	27
037	1	3	8	6	3	8	9	8	18	23	16	28	24
038	0	1	2	1	0	2	5	3	13	6	6	5	11
039	145	48	30	133	51	172	73	240	239	253	57	357	348
040	0	1	0	0	1	0	0	5	10	15	7	24	37
041	90	173	173	190	167	211	183	172	178	187	181	235	244
042	4	1	1	5	1	2	4	8	3	7	3	11	8
043	0	2	2	2	7	4	4	5	12	6	12	7	8
044	1	3	0	4	13	10	6	9	13	15	22	23	24
045	14	23	118	24	205	23	190	44	64	72	167	62	48
049	0	0	1	0	2	0	1	0	0	0	7	0	0
Sub-tot	535	476	545	593	625	646	682	720	798	841	759	1110	1119

Appendix VIII
Minor Group Composition By Year
Raw Numbers
(Part Two of Three)
(Blue Collar Occupations)

	Year												
Code	1850	1856	1860	1864	1870	1875	1880	1886	1890	1895	1900	1905	1910
050	4	3	4	0	5	5	3	2	4	3	12	7	5
051	12	19	18	35	20	41	35	52	69	54	35	22	32
052	1	1	3	0	4	2	3	3	3	4	3	2	0
053	0	1	0	1	9	4	9	6	14	12	45	13	26
054	0	0	28	4	0	0	27	3	0	0	16	1	0
055	1	2	0	3	0	4	2	4	8	13	14	20	21
056	0	0	0	0	0	0	1	2	8	16	15	13	13
057	6	9	11	14	12	28	23	28	28	34	33	37	37
058	3	9	16	15	18	38	52	46	55	66	73	89	84
059	1	0	0	2	2	2	2	1	8	5	11	10	19
060	0	0	0	0	0	0	0	1	0	2	1	1	2
061	186	129	128	152	93	125	131	168	153	127	73	63	75
062	0	2	74	4	84	7	127	37	31	61	168	50	31
064	43	10	38	13	25	34	86	67	60	40	33	25	21
070	4	13	7	5	3	14	7	29	49	56	52	85	72
072	28	17	27	17	15	13	10	27	92	41	31	18	12
073	10	25	4	14	3	8	1	4	4	5	3	7	2
075	117	74	118	71	157	47	114	12	6	2	1	0	0
076	17	28	12	20	3	5	3	3	3	1	2	0	0
077	72	44	51	67	42	43	44	45	40	53	64	55	71
078	1	2	2	1	4	1	2	0	2	5	4	5	4
079	58	27	39	31	22	26	35	29	23	27	35	27	30
080	77	58	84	68	78	74	52	113	527	379	325	141	117
081	66	35	47	36	28	36	38	51	70	39	56	38	38
082	7	7	20	17	10	23	22	13	20	20	11	12	10
083	84	62	63	80	61	62	57	52	80	56	53	65	54
084	50	36	39	64	50	71	56	80	76	66	113	160	205
085	0	0	0	1	0	1	0	2	3	6	23	37	47
087	17	8	13	18	25	36	32	43	45	55	58	86	74
088	6	3	5	4	6	2	4	4	3	4	7	5	6
092	21	11	12	11	9	25	27	29	33	29	28	22	17
093	65	46	64	65	60	70	82	74	70	74	88	76	68
094	3	1	0	0	0	0	1	1	2	2	3	4	0
095	420	357	337	422	322	297	278	236	233	212	266	254	196
096	0	1	1	3	2	0	9	10	13	18	56	24	21
097	26	36	47	48	21	31	20	23	41	30	36	27	13
098	235	95	209	102	123	90	161	147	164	185	217	218	216
099	411	239	292	457	625	350	683	513	567	610	637	646	588
Sub-tot	2052	1410	1813	1865	1941	1615	2239	1960	2607	2412	2701	2365	2228

Appendix VIII
Minor Group Composition By Year
Raw Numbers
(Part Three of Three)
(Other Occupations)

					Year								
Code	1850	1856	1860	1864	1870	1875	1880	1886	1890	1895	1900	1905	1910
100	19	9	8	194	24	25	20	14	8	10	4	21	27
110	33	2	19	3	1	5	9	13	33	31	26	34	31
120	4	4	5	3	1	0	23	4	3	11	10	15	31
130	39	0	25	0	66	0	55	0	0	2	15	3	2
222	476	0	621	0	841	0	498	0	0	0	456	0	0
333	1072	0	893	0	577	0	836	0	0	0	736	0	0
999	277	78	283	138	122	205	128	186	214	219	218	243	233
Sub-tot.	1920	93	1854	338	1632	235	1569	217	258	273	1465	316	324
Grand Tot.	4507	1979	4212	2796	4198	2496	4490	2897	3663	3526	4925	3791	3671

See Appendix II for code explanation
All totals are of reported occupations. Directory year totals are always less than population size (Appendix IV) because this value is estimated for these years.

Appendix IX.1
Raw Numbers Used to Determine Histograms
Outflow
Five or More Fathers (Sources) Reported in Occupation
1850 to 1870

Sour	Total	Primary		Secondary		Succession		Direct	
Code	Sour.	Trac.	Poss.	Trac.	Poss.	Trac.	Poss.	Trac.	Poss
21	17	3	32	4	57	--	--	2	31
31	5	--	--	1	37	--	--	--	--
41	22	15	87	1	29	8	27	7	60
51	7	3	31	3	55	--	--	1	27
61	17	13	108	1	31	5	5	8	103
64	7	1	24	3	100	--	--	0	20
77	9	4	39	1	44	4	12	0	27
79	7	2	28	2	48	--	--	2	27
80	13	--	--	4	89	--	--	--	--
81	8	--	--	--	--	--	--	--	--
82	5	--	--	--	--	--	--	--	--
83	13	6	79	4	67	4	9	2	70
84	6	3	20	1	69	3	7	0	13
93	10	5	13	--	--	5	11	--	--
95	60	34	103	3	37	18	35	16	68
98	20	10	123	4	95	3	20	7	103
99	36	21	138	6	50	15	63	6	75

(Base Total 295)

In all tables in this appendix, dashed lines indicate that that occupation was not used in figuring standard scores for that network or contact type because the values indicated do not meet the restrictive criteria.

Appendix IX.2
Raw Numbers Used to Determine Histograms
Outflow
Five or More Fathers (Sources) Reported in Occupation
1860 to 1880

Sour	Total	Primary		Secondary		Succession		Direct	
Code	Sour.	Trac.	Poss.	Trac.	Poss.	Trac.	Poss.	Trac.	
Poss									
21	5	2	38	1	71	--	--	1	36
41	35	19	96	5	126	12	31	7	65
45	6	2	119	2	107	1	36	1	83
61	38	25	169	6	67	14	20	11	131
64	8	2	38	6	120	2	5	0	33
75	13	4	93	5	152	--	--	3	89
77	14	3	40	3	55	1	9	2	31
80	11	5	82	5	137	--	--	5	78
81	14	--	--	--	--	--	--	--	--
83	16	8	118	2	156	3	5	5	113
87	8	--	--	--	--	--	--	--	--
93	18	5	25	0	5	5	10	0	5
95	68	32	133	10	86	17	35	15	97
97	6	0	32	2	122	--	--	0	32
98	28	13	153	7	139	7	32	6	121
99	62	49	218	3	83	26	77	23	141

(Base Total 395)

Appendix IX.3
Raw Numbers Used to Determine Histograms
Outflow
Five or More Fathers (Sources) Reported in Occupation
1870 to 1890

Sour Code	Total Sour.	Primary Trac.	Primary Poss.	Secondary Trac.	Secondary Poss.	Succession Trac.	Succession Poss.	Direct Trac.	Direct Poss
41	24	16	95	2	140	9	34	7	61
45	13	9	154	2	128	0	6	9	148
58	6	0	33	2	171	0	11	0	22
61	27	13	67	8	158	13	22	0	45
62	6	1	67	3	158	--	--	1	65
64	5	3	48	0	177	2	5	1	43
72	5	--	--	--	--	--	--	--	--
75	19	1	45	11	180	--	--	0	44
79	5	2	38	2	57	--	--	2	34
80	10	8	130	1	133	2	41	6	89
82	6	--	--	--	--	--	--	--	--
83	17	3	8	--	--	3	8	--	--
84	6	0	17	0	25	0	12	0	5
93	14	5	20	--	--	5	13	0	7
95	58	17	66	17	159	11	23	6	43
98	17	12	79	4	197	9	25	3	54
99	92	61	225	7	40	22	43	39	182

(Base Total 369)

Appendix IX.4
Raw Numbers Used to Determine Histograms
Outflow
Five or More Fathers (Sources) Reported in Occupation
1880 to 1900

Sour Code	Total Sour.	Primary Trac.	Primary Poss.	Secondary Trac.	Secondary Poss.	Succession Trac.	Succession Poss.	Direct Trac.	Direct Poss
39	9	5	195	1	87	--	--	5	191
41	35	21	110	4	104	10	26	11	84
45	12	5	128	6	139	3	31	2	97
58	9	3	47	4	81	0	6	3	41
61	39	18	60	10	95	6	10	12	50
62	8	1	67	5	148	0	19	1	48
64	11	6	52	2	160	--	--	3	48
75	13	--	--	--	--	--	--	--	--
77	10	4	32	3	75	3	6	1	26
81	5	0	8	--	--	--	--	0	5
83	15	--	--	--	--	--	--	--	--
87	8	0	8	--	--	0	5	--	--
93	14	4	16	--	--	4	16	--	--
95	50	18	84	8	128	13	36	5	48
97	8	--	--	--	--	--	--	--	--
98	17	11	116	3	96	5	27	6	89
99	84	49	212	12	53	18	48	31	164

(Base Total 392)

Appendix IX.5
Raw Numbers Used to Determine Histograms
Inflow
Five or More Sons (Destinations) Reported in Occupation
1850 to 1870

Dest Code	Total Dest.	Primary Trac.	Primary Poss.	Secondary Trac.	Secondary Poss.	Succession Trac.	Succession Poss.	Direct Trac.	Direct Poss
33	6	--	--	0	28	--	--	--	--
39	9	2	26	1	65	--	--	2	26
41	27	12	63	1	28	7	22	5	41
45	33	6	43	12	90	--	--	6	42
61	5	5	113	0	37	5	17	0	96
62	5	4	53	0	97	--	--	4	53
77	12	4	31	1	35	4	9	0	22
83	9	5	55	3	101	4	13	1	42
84	7	4	23	2	37	3	6	1	17
93	11	5	10	--	--	5	10	--	--
95	35	23	113	6	37	18	60	5	53
98	20	6	71	5	116	3	20	3	51
99	63	43	150	8	36	15	36	28	114

(Base Total 295)

Appendix IX.6
Raw Numbers Used to Determine Histograms
Inflow
Five or More Sons (Destinations) Reported in Occupation
1860 to 1880

Dest Code	Total Dest.	Primary Trac.	Primary Poss.	Secondary Trac.	Secondary Poss.	Succession Trac.	Succession Poss.	Direct Trac.	Poss
33	7	--	--	--	--	--	--	--	--
39	15	3	68	6	205	--	--	3	68
41	31	17	66	3	106	12	35	5	31
45	36	13	86	7	104	1	6	12	80
57	5	--	--	--	--	--	--	--	--
58	6	0	62	5	179	--	--	0	62
61	20	19	172	0	71	14	38	5	134
62	19	10	104	5	143	--	--	8	100
64	5	2	36	0	87	2	8	0	28
77	9	1	49	0	17	1	14	0	35
83	5	3	84	1	200	3	16	0	68
84	11	0	18	0	62	--	--	0	14
92	5	0	25	0	35	--	--	0	25
93	20	5	18	0	7	5	18	--	--
95	35	26	168	6	175	17	68	9	100
98	32	14	113	15	188	7	28	7	85
99	77	54	243	9	56	26	62	28	181

(Base Total 395)

Appendix IX.7
Raw Numbers Used to Determine Histograms
Inflow
Five or More Sons (Destinations) Reported in Occupation
1870 to 1890

Dest Code	Total Dest.	Primary Trac.	Primary Poss.	Secondary Trac.	Secondary Poss.	Succession Trac.	Succession Poss.	Direct Trac.	Direct Poss
2	5	0	17	0	105	--	--	0	17
6	6	--	--	--	--	--	--	--	--
21	6	--	--	--	--	--	--	--	--
39	46	18	135	18	151	--	--	17	131
41	34	13	54	8	121	9	24	4	30
45	6	2	150	3	146	0	13	2	137
58	11	4	98	6	159	0	6	4	92
61	22	17	125	2	132	13	27	4	98
64	5	4	97	0	160	2	5	2	92
77	5	1	28	0	26	--	--	0	24
80	41	13	106	16	177	2	10	11	96
83	8	3	17	--	--	3	17	--	--
84	12	0	6	0	17	0	6	--	--
92	7	0	15	--	--	--	--	0	14
93	13	5	15	--	--	5	14	--	--
95	23	15	150	6	107	11	58	4	92
98	25	19	122	4	165	9	17	10	105
99	43	37	257	1	30	22	92	15	165

(Base Total 369)

Appendix IX.8
Raw Numbers Used to Determine Histograms
Inflow
Five or More Sons (Destinations) Reported in Occupation

1880 to 1900

Dest	Total	Primary		Secondary		Succession		Direct	
Code	Dest.	Trac.	Poss.	Trac.	Poss.	Trac.	Poss.	Trac.	Poss
33	19	2	13	9	152	--	--	2	11
41	26	13	69	5	140	10	35	3	34
44	5	--	--	--	--	--	--	--	--
57	6	--	--	--	--	--	--	--	--
58	6	5	26	0	90	0	9	5	17
61	10	7	59	1	145	6	39	1	20
62	19	13	131	1	111	0	8	13	123
77	6	4	45	0	24	3	10	1	35
79	6	--	--	--	--	--	--	--	--
80	40	12	131	17	107	--	--	12	128
84	5	0	5	--	--	--	--	--	--
87	5	C	13	--	--	0	8	0	5
92	5	--	--	--	--	--	--	--	--
93	16	4	14	--	--	4	14	--	--
95	36	18	134	6	57	13	50	5	84
98	27	16	134	6	140	5	17	11	117
99	48	32	191	7	76	18	84	14	107

(Base Total 392)

Appendix X
Reported Female Occupations
Major Group
By Year
Raw Numbers

	Year												
Code	1850	1856	1860	1864	1870	1875	1880	1886	1890	1895	1900	1905	1910
0	17	5	36	7	26	23	52	34	58	55	25	13	25
1	--	--	1	--	--	--	1	1	4	8	65	92	76
2	--	--	--	--	--	--	--	1	--	--	--	2	4
3	--	--	--	--	4	4	1	12	72	116	84	148	173
4	5	20	135	14	121	27	165	46	93	73	170	82	65
5	14	6	339	3	245	4	275	15	42	35	596	45	31
6	--	--	1	--	--	--	--	--	--	--	2	--	--
7	25	77	161	--	154	1	216	--	4	3	9	--	--
8	--	--	1	--	7	--	19	--	118	53	185	23	21
9	--	--	1	--	3	--	2	--	23	12	34	6	13
Other	302	463	--	529	3391	414	3252	618	736	861	847	822	741
Total	363	571	675	553	3951	473	3983	727	1150	1216	2017	1233	1149

Data for 1860, 1870, 1880, and 1900 are from census records. All other data are from directories. Women included here are all those with any report associated with their name. If nothing was reported, they were not included. Other category includes "At Home", "in school", "Mrs", "Miss", "Widow", and the like. See Appendix I for code explanation.